



The South Australian Naturalist

The Journal of the Field Naturalists' Section of the Royal Society of South Australia and of the South Australian Aquarium Society.

Adelaide

F.N.S.

Nov., 1930

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No. 1.

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The authors of papers are responsible for the facts recorded and opinions expressed.

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EXCURSIONS.

1931.

Feb. 14—Train from Adelaide at 1.35 p.m. to Outer Harbour. Dredging in gulf, weather permitting. Members are requested to bring glass screw-top jars if they wish to obtain specimens.

Mar. 7—Outer Harbour. Train at 1.35 p.m. Shells, Mr. W. J. Kimber.

The
South Australian Naturalist.

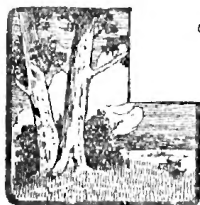


Vol. XII.

ADELAIDE, NOVEMBER, 1930.

No. 1.

The Season's Greetings.



The Chairman of the Section desires to convey to every member greetings appropriate to the approaching Season, and to express the hope that the present sombre outlook may soon be changed to a lasting brightness.

NOTES ON THE SLEEPY LIZARD.

Trachysaurus rugosus (Gray).

By C. E. COLE.

Of our Australian reptiles the best known and most frequently met with, is the Sleepy or Stump-tailed Lizard. One has only to drive along a stretch of country road during the spring, to see numerous carcasses of those unfortunate individuals, that have attempted to cross the highway at the same time as it has been required by man and his mechanical life destroyer, the automobile. Being run over by a motor is not always fatal to the Sleepy, as a number have been brought to my notice that have survived the ordeal; and although somewhat out of shape have lived for some time in apparently the best of health.

The Stump-tail is the most bizarre member of the Skink family, the *Scincidae*, which is almost world-wide in distribution, and includes such well-known South Australian lizards as the Blue-tongued and Water lizards, the Spiny-tailed, White's, and the Morning Skinks, and numerous other small, but none the less interesting members of our lizard population.

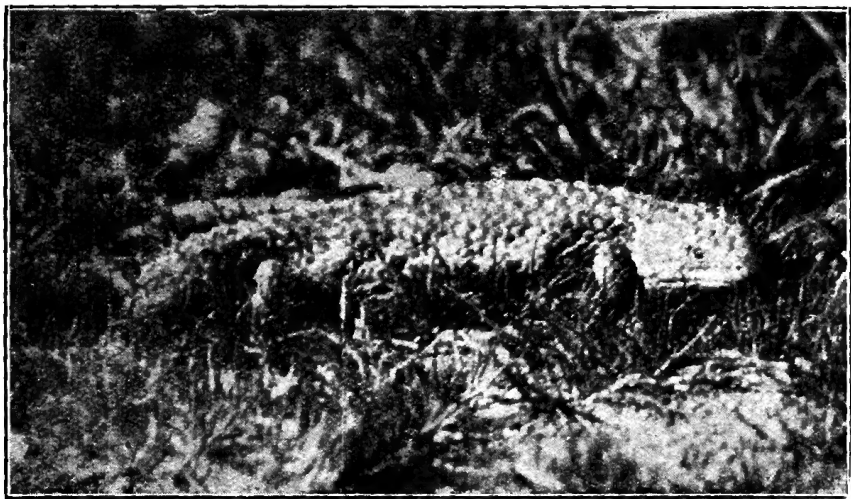
The late Mr. Edgar Waite (1) gives an interesting account of this species, and illustrates a young albino, which condition is comparatively rare among reptiles; and also a female with the foetuses *in situ*—in this case two; but it does not always follow that this number are produced, there being many cases of a single young. I have heard more than once of three new arrivals being found by the owner of a vivarium, and Le Souef (2) gives four as the usual number born at a time, which I think is rather high, but the number may vary in different parts of Australia. Mating may occur in the early spring, during which time great numbers are to be seen abroad, but although I have had a number of specimens for some time, I have not been able to verify this. The young are produced during the late autumn, the first appearing in my vivarium this year on the 30th April.

Waite (3) states that he has removed an example of this lizard from the stomach of a python; this snake in the wild state may have a Sleepy now and again for breakfast, but in captivity at the Adelaide Snake Park, the two share the same enclosure without any loss on either side. It does not, therefore, appear that the lizards or snakes are very ill-disposed towards each other, as has been stated by some writers.

(1) Waite, Records S.A. Museum, iii, 1, p. 21. figs. 5-6, 1925.

(2) Le Souef, "Wild Life in Australia," p. 408.

(3) Waite, loc. cit., p. 23.



The Sleepy Lizard.

—Photo by G. E. Cole.

Although usually very slow in movement, quite a mild exhibition of speed can be given by this reptile when in a hurry. It usually does not go far when pursued, but turns to face the danger with open mouth and distended body, which is deflated with a hissing noise. The jaws are powerful, and capable of giving a nip which will not want to be sampled again in a hurry.

During the time I have had this species in my possession, I find that it is the favourite pet amongst the reptiles, and is to be found in a great many gardens, and kept under almost as many conditions; some being free to roam at will and fend for themselves, while others are kept in a small box with hardly room to fully extend the body. If treated well and properly fed, a more hardy and interesting lizard would be hard to find.

Feeding is a very simple problem, and if given small pieces of a great many of the items of the dinner table menu in a raw state, with the addition of a few garden snails and a supply of fresh water, the reptile will be in good condition for its winter inactivity; since unless food is taken in abundance during the summer, disaster will overtake the lizards before the spring. I have found that this lizard is fond of the red berries of the African Boxthorn, and will devour these before any other food offered; of course, this may be because of the bright colour of the fruit as compared with the other fruits, etc., offered.

The swimming powers of the Stumpy are very limited. My specimens were, during last summer, in an enclosure containing a small pond inhabited by the long-necked tortoise (*Chelodina longicollis*. Shaw), and I have been called upon on a number of occasions to rescue an unfortunate lizard that had fallen in; and on one occasion on returning home, after being absent for about three hours, found the apparently lifeless form of one at the bottom of the pool. After having got rid of all the water possible from the reptile's interior, I proceeded to apply warmth, and to work the legs—as is practised with the arms of human-beings for artificial respiration in similar circumstances—and within half-an-hour had the satisfaction of observing a slight movement, and within an hour was able to return the then partly revived Sleepy to its usual place, and by the following morning it was again in the best of health.

Almost any natural history will give the reader further information about this species, many writers having described this lizard and its ways; the first being Captain William Dampier, who saw the reptile first at Sharks' Bay and described it as having two heads; one, of course, being without mouth or eyes.

Of modern writers, Waite (4), McCoy (5), Bolam (6), Lucas and Le Souef (7), and Aflalo (8), have all given descriptions of its habits.

The facts set out in this paper are, as far as possible new; but in a species so widely distributed, and so common as this one is on the mainland of Australia, similar statements may have been published unknown to the writer.

- (4) Waite, "The Reptiles and Amphibians of South Australia," p. 139. 1929.
(5) McCoy, Prod. Zool., Vict., dec. XI., p. 4. 1885.
(6) Bolam, "The Trans-Australian Wonderland." 1923. p. 35.
(7) Lucas and Le Souef, "Animals of Australia," p. 246. 1909.
(8) Aflalo, "Natural History of Australia." 1896. p. 178.

[Note by the Editor: This season I have seen Sleepy Lizards on the roads in great numbers. One of the biggest specimens I have seen opened his mouth as I approached. When I picked him up he had a partly chewed Billy Button (*Craspedia*) in his mouth.]

NOTES ON NATIVE TRIBE FORMERLY RESIDENT AT ORROROO, SOUTH AUSTRALIA.

By JAMES GRAY.

Much of the information in this account was supplied by Mr. J. H. Cottrell, who went with his parents to Pekina Station in 1863 (he then being eight years of age).

Pekina Station, then owned by Mr. Price Maurice, extended approximately from the present township of Pekina to that of Johnburgh. The only fenced country in it was the "horse paddock," a flat in the hills S.W. of the present township of Orroroo.

The tribe then camped on various sites along the Pekina Creek, which had permanent running water up to where it left the hills. In dry seasons even as far as the present ford on the Orroroo-John Road.

Pekina Creek is west of the present township. Orroroo Creek is south-east, and has a permanent spring at the point where it leaves the hills. It did not have permanent running water.

Camp sites were frequently changed, a position being occupied anything from one to fourteen days. Cottrell's opinion for the frequent changes is that the camps soon became foul from fleas and lice. The camp consisted of approximately 50 natives (men, women, and children).

MEANING OF ORROROO.

The meaning usually given, "That it is the native imitation of the sound of wind blowing through *Acacia* trees, or *or-roo-oo-oo*" is incorrect. Its true meaning is "early start." The true explanation is that the usual camping ground of the tribe was on the banks of the Pekina Creek whereas the kangaroo hunting grounds were the flat S.E. of the present township, that is, close to the spring on the Orroroo Creek; when intending to hunt kangaroos it was the custom of the tribe to go to the spring of the Orroroo Creek to camp for the night so as to be in a position for a good start at dawn. Hence "Orroroo" = "Early start" became the name of that place. It was known to the "whites" on the station that kangaroos "worked" up from the plain (S. and E. of the present township) to the spring in the Orroroo Creek in the morning.

Cottrell as a boy of eight years had as playmates the lads of the camp. He remembers three of them, more friendly than others, who were initiated when about 18 yrs of age. The adult natives said they were made "Bernatia" (men). At this initiation ceremony they were circumcised. They then disappeared from the camp for three or four days. The operation included circumcision only. None of the tribe was subincised. Cottrell saw natives who came to visit the tribe, from Pt. Augusta and Melbourne; they, too, were circumcised but not sub-incised. When older he saw natives at Lake Hart who were sub-incised, but none from the districts of Pt. Augusta to Orroroo.

FIRE. Fire was made by rubbing the end of a *yacca* stick in a piece of very dry red gum. The *yacca* stick being rotated by rubbing between the palms of the hands. When travelling the tribe carried a fire-stick, which would be freshed up in the dry grass and vegetable debris collected at the butt of trees by floods. Nearly every tree in the Pekina Creek area shewed scars at its base.

FOOD. Following the killing of a kangaroo, the animal was gutted—the gut being given to the dogs—and carried back to camp. A fire was prepared by the women in a sandy place, and stones were heated. Dry gum and mallee leaves were placed in the abdominal cavity, then the hot stones were raked in on the leaves. The coals were raked out of the fire and the kangaroo placed on the remaining stones and hot sand; hot ashes and sand were heaped over it. When cold enough the carcase was removed and eaten, whether cooked properly or not. The animal was dismembered and the men took their shares to their wurlies.

Grubs were dug from the ground and cooked and eaten. I think these would be the pupæ of the big Hepialid moths. I have seen the empty pupal cases of these moths around the bases of the big gums in the Pekina Creek, and have specimens of the moth. The natives called the "grubs" "Barti."

EMUS. Emus were trapped by nets. The string for the nets was at that time made from the gunny sacks in which the sugar (brown) was brought to the station. The gins would spin the string by rolling the jute (?) on their thighs.

A long length of net would be stretched out, supported on sticks. The emus were quietly worked towards the nets and when near were startled by all the natives jumping up, showing themselves and shouting and gesticulating. The nets were not stretched taut so that, on the sudden rush the emus became tangled in the meshes—the nets were not used as a pen, but as a snare, the emu being tangled.

Natives from the surrounding districts, Melrose and Pt. Augusta, visited the local tribe. Ceremonies lasting over a week were sometimes held, though Cottrell did not see any of them.

Though he must on many occasions have passed the carved rock in the Pekina Creek (described in a previous number of this Journal by Hosking), it was never referred to by any of the natives with whom he came in contact.

BURIAL. The body was tied to a "stick" which was supported on two forked upright sticks, and a fire lit under it. The "smoking" was continued for anything from one to seven days. Sometimes the body was carried about with the tribe. The body-carriers making occasional "side-steps" and abrupt turns, and actual steps to one side while continuing in the same direction. This was done to mislead "Muldabi." The body was eventually buried in a shallow grave.

Not everyone was smoked. Cottrell thinks it was only "imported people." He was not allowed to see the actual burial and does not know in what position the body was placed.

(To be continued.)

FORTY-SEVENTH ANNUAL REPORT OF THE FIELD NATURALISTS' SECTION OF THE ROYAL SOCIETY OF SOUTH AUSTRALIA.

For Year Ending August 31, 1930.

The work of the Section has been maintained during the last twelve months, and the following report is presented for the information of members.

Membership. Last year's membership was 150, of which total 110 were financial. This year's figures are 150 members, and of this number 125 are financial.

Excursions. The programme of outings arranged by the Committee was on a somewhat reduced basis, with the hope that a better attendance might result. Our leaders are to be thanked for the time devoted to the enlightenment of members on these occasions. Various trips were undertaken during the year to places of interest, and visits were also made to the Botanic Garden and Museum.

The Committee also reluctantly decided to abandon the motor trips, on account of the losses involved, through not being sufficiently well patronised to justify a continuance of these excursions at present.

Lectures. We have been favoured with an interesting series of lantern lectures during the period under review as follows:—"The Stellar Universe," by Professor R. W. Chapman, C.M.G., M.A., B.C.E., F.R.A.S.; "The Architecture of India," by Rev. J. H. Allen, B.Sc.; "Honolulu, California, and Arizona" by Dr. R. H. Pulleine, M.B., Ch.M.; "A Trip to Cairns," by Mr. A. J. Morison; "The Phenomena of the Atmosphere," by Mr. A. G. Edquist; "The Association of Insects with Plants," by Dr. James Davidson, D.Sc.

Others who have assisted with lectureries were:—Mr. A. M. Lea, F.E.S., on "Some New Guinea Insects"; Professor J. B. Cleland, on "A Trip to the Macdonnell Ranges"; Mr. J. G. Wood, on "Wallace's Line"; Mr. E. A. S. Thomas, on "Native Timbers." And to-night we are to have Dr. C. Fenner, F.G.S., on "Some Australian Fossils."

Exhibits. Several members have contributed to this part of our programme, and we are at all times pleased to see members bring along exhibits.

"The South Australian Naturalist." Our Journal has been published regularly each quarter under the editorship of Mr. W. Ham. The part to be issued this month will complete

Volume 11. Contributions from Professor J. B. Cleland, on "Notes on the Botany of Central Australia"; Mr. H. M. Hale, on "A Remarkable Fresh-water Crayfish"; Mr. E. H. Ising, "Botanical Notes"; Mr. W. Ham, "A Field Naturalists' Visit to Yorketown," and notes from the Shell Club, comprise some of the principle matter published, in addition to other notes of interest.

Wild Flower Show. The 1929 Annual Show was held on October 10 and 11, in the Adelaide Town Hall, which was made available by the Lord Mayor. The standard of past shows was well maintained, and resulted in a successful function. The balance-sheet showed a profit of £39/19/4, which was a little over £6 in advance of the previous year.

Herbarium. The work in the Herbarium has been continued, several meetings have been held, and the arranging and mounting of specimens has been proceeded with.

Australian Association for the Advancement of Science, Brisbane, May-June, 1930. At these meetings the F.N.S. was represented by Messrs. A. G. Edquist and J. F. Bailey.

Resignation of Secretary. During the year the Section sustained a great loss, when Mr. E. H. Ising tendered his resignation as Honorary Secretary, after 12 years of devoted service, dating from December 31, 1929. At a later date an opportunity was taken of making a presentation to Mr. E. H. Ising in recognition of his services.

We have, however, been fortunate in securing his services as Show Secretary for this year, as his past experiences in Flower Show work will make his help in this capacity a very valuable contribution to the success of our 1930 Show.

New Secretary. Following Mr. Ising's resignation, nominations were called for, through "The South Australian Naturalist," for the position of Hon. Secretary without response.

At a meeting of the Committee held on the 15th of January, I consented to take the position of Acting Hon. Secretary, and since then have continued to act in that capacity.

H. WOODLANDS,

Acting Hon. Secretary.

19/8/30.

WILD FLOWER SHOW, 1930.

The eleventh annual show of the Section was held in the Adelaide Town Hall on Friday and Saturday, 10th and 11th October, 1930. It was opened at 3 p.m. on the Friday, and the official opening was made by the Lady Mayoress (Mrs. A. L. Bonython) at 8 p.m. on the same evening. In a happy speech, the Lady Mayoress pointed out how that a contemplation of the beauty of nature around us would tend to lift the depression that was so pronounced just at this time. The Chairman (Mr. F. K. Godfrey) introduced Her Ladyship, and Mr. E. H. Ising proposed a vote of thanks, seconded by Mr. B. B. Beck, while a son of the latter presented a bouquet. A massed display of flowers was made by using the stage as a background and made a striking effect as the hall was entered: convenor, Mrs. B. B. Beck, Scientific classification of named flowers was convened by Mr. J. F. Bailey, Mr. J. G. Wood, M.Sc., Prof. J. B. Cleland and Dr. R. S. Rogers, M.A. (orchids); two large tables were displayed, each vase being labelled and the species arranged in families. The schools' exhibits was convened by Miss J. M. Murray, who had charge of receiving, unpacking and displaying the flowers, each school being kept separate. The following schools contributed:—Macclesfield, Mylor, Maggea, Crafers, Burrungule (fifth prize), Uraidla (second prize), Birdwood, Ashbourne, Owen, Cummins, Springton, Coonahpyn (sixth prize), Monarto South (first prize), Clare, Echunga, Wolsley, Basket Range (fourth prize), Charleston, McLaren Vale, Stirling East, Wirrega, Wasleys, Kangarilla, Belvidere, Tintinara, Mt. Barker, Keyneton, Upper Sturt, Laura, Hermitage, Woodside, Athelstone, Hindmarsh Tiers, Blackwood, Tweedvale, Aldgate (third prize), Kersbrook, Naturi, Bridgewater, Myponga. The judges for the schools' collections were Messrs. J. F. Bailey, Prof. J. B. Cleland and Mr. W. Champion Hackett. The flowers were exceptionally good, no doubt on account of the good season experienced.

The Shell Collectors' Committee of the Section staged a fine exhibit of shells, a large series was shown having been collected on our local beaches; Mr. W. J. Kimber (Chairman) and Mr. F. K. Godfrey (Hon. Sec.) had charge and gave lecturettes during the Show.

Mr. L. Reynolds was convenor for the cultivated native flowers, and a wonderful collection was shown, having been grown by Mr. W. Burdett, of Basket Range. West Australia was particularly well represented in the collection, and this exhibit drew enthusiastic interest throughout the Show. Mr. Edwin Ashby, of Blackwood, showed a fine assortment from his garden.

and some of the flowers were among Australia's best species. Mr. A. K. Newberry, of Mt. Lofty, and Miss M. A. Parkhouse, of Woodville, also exhibited specimens grown by them. All these collections added materially to the success of the Show and were an example as to how well some of our flora will thrive under cultivation. Each species was labelled, thus making the exhibit of educational value.

The Interstate exhibits were in charge of Messrs. L. Reynolds and W. Champion Hackett. Flowers were sent from the following States:—Queensland: from the Queensland Naturalists' Club (per Miss E. E. Baird) two parcels of pressed specimens and one parcel of fresh flowers, also one parcel of fresh flowers (per Mrs. Slaughter) from Thulimbah. These made a fine series from the northern State. Victoria: from the Field Naturalists' Club (per Mr. H. B. Williamson) a good collection of flowers from Bendigo and South Gippsland. West Australia: from the Field Naturalists' Club (per Lt.-Col. B. T. Goadby) a parcel of flowers from Perth. Unfortunately, through a delay in the Post Office, this parcel was received too late for the Show. From Brunswick Junction (per Mr. R. T. Stubbs) a large assortment, including several species of kangaroo paws. From Mr. H. M. Beames, Kalgoorlie, specimens of dry country flora including a blanket plant. From Mr. G. F. Berthoud, Hamel, a beautiful collection of variously coloured everlastings. From Mr. R. R. B. Ackland, a collection from Wongan Hills, which kept in splendid condition; the *Verticordias* were very fine.

The painting competition was convened by Mr. L. H. Howie, and the awards were made as follows:—Watercolour Plant Studies (for Central Schools only): First prize, Miss J. Steer, Norwood; second prize, Miss J. Steer; third prize, Miss R. Norris, Goodwood. Watercolour Design (for Central Schools only): First prize, Miss M. Shepherd; second prize, Miss R. Norris; third prize, Miss J. Shepherd. Watercolour or Oil Painting for Amateurs: First prize, Miss L. Mulhall (vase of wild flowers); second prize, Mrs. N. Tamblyn (river scene); special mention, Miss L. Tester (Sturt Peas). The entries were good, and Miss Maude Priest acted as judge. Misses M. Roeger and J. M. Murray made donations towards the prizes.

The South Australian Aquarium Society, through the President, Mr. H. M. Hale, and assisted by Messrs. C. E. Cole, G. F. Blewett, and P. Boase, arranged a very fine exhibit of fishes and water plants. The staging and lighting produced a fine effect, and the exhibit was much admired.

Mr. R. R. F. Bellchambers, manager of "The Sanctuary," Humbug Scrub, and son of the late Mr. T. P. Bellchambers, exhibited a set of photographs taken in "The Sanctuary."

Capt. S. A. White had a case of birds on view and attended during the course of the Show and gave lecturesses to interested groups on both days.

A set of coloured pictures of West Australian wild flowers was presented by the "West Australian Newspapers Ltd." and were much admired, as were a set of photographs in black and white kindly lent by the Public Library (per Miss Lucy).

A fine series of exhibits was kindly lent by the Museum and consisted of cases of butterflies, moths, beetles, etc., crabs and crayfish, and 20 native weapons and implements.

The Waite Agricultural Research Institute, through the Director, Dr. A. E. Richardson, made an exhibit of the Lucerne Flea, arranged by Dr. J. Davidson.

The Botany Department, by kind permission of Prof. T. Harvey Johnston, made an interesting exhibit of fossil botany, arranged and staged by Mr. J. G. Wood, M.Sc.

Prof. J. B. Cleland had a table of various exhibits consisting of ephemeral plants, fungi, seaweeds, fruits of various eucalypts, Hakeas, etc.

The Department of Agriculture, through the kindness of Mr. R. C. Scott, Supervisor of Experimental Work, made an exhibit of native grasses, fodders and some well-known noxious weeds; these were staged by Mr. —. Warren.

An exhibit of table and chairs from the Woods and Forests Department was arranged through the kindness of the Conservator of Forests, Mr. E. Julius.

The Flower Stall was convened by Mesdames H. M. Hale and C. E. Cole, and they made a fine display and did good business with sales of flowers.

Mr. J. F. Bailey generously presented a large number of pot plants of native flowers for sale. Mr. Bailey also provided a number of pot plants for decorative purposes.

Mr. A. J. Wiley showed samples of his wood turning in vases, bowls, etc., made from Australian timbers, especially the mulga of the far north. Mr. R. C. Smith also exhibited a number of examples of his work in turned woods.

The convenor for minerals and timbers was Mr. E. A. S. Thomas, who obtained the loan of a fine set of minerals from the Mines Department and supplemented them with some of his own. Our timber samples were also on view, and Mr. Thomas also showed some of his taken from Australian trees.

A fine display of everlasting and other flowers were sent from Irrappatana on the far northern line by the kindness of the Chief Engineer of the Ways and Works and the Chief Traffic Manager of the Commonwealth Railways.

Miss E. Hosking made a very interesting exhibit of poker work in various objects, using the native flora of a basis for the designs.

The pond life exhibit consisted of glass bowls with water insects and plants, and was arranged by Mr. J. E. L. Machell, of the Education Department.

The Microscope Committee placed several microscopes and many slides at our disposal, and the Chairman, Mr. W. A. Harding, was convenor, with Mr. Briggs as assistant.

Dr. R. H. Pulleine showed a very interesting and unique collection of succulent plants grown by him, the various species coming from Mexico and South Africa.

There were many willing helpers during the Show and it is not possible to mention all who assisted, but the following assisted in a special way. Messrs. L. Reynolds and C. E. Cole gave valuable assistance during the whole course of the Show, the latter also showed some live lizards and a snake; the glass cases for these were kindly loaned by Mr. K. Minchin, of the Snake Park. Miss E. Ireland assisted by distributing tickets and by typing circulars. Mrs. A. Day acted as doorkeeper and treasurer. Mr. W. H. Selway had the school labels prepared and displayed. Ticket writing was arranged by Dr. C. Fenner and Mr. Tillett. Messrs. E. V. Dix and L. Reynolds had window posters designed and distributed in the shops.

Our best thanks are also due to the following for loans or gifts:—The Rosella Preserving and Manufacturing Co., Ltd., through the Manager, Mr. E. H. Cato, generously lent glass jars; the Vacuum Oil Co. Prop. Ltd., through Mr. C. Drummond, kindly lent cases, and the Shell Co. (Aust.) Ltd. generously presented copies of their wild flower book for distribution.

On the first evening Mr. C. E. Cole gave a lantern lecture on some "Australian Animals" and Mr. H. M. Hale, Curator of the Museum, gave one on the "North Flinders Range" on the Saturday evening. Mr. G. Beck kindly lent and operated the lantern.

The following also assisted by presenting specimens which were thankfully received:—A collection of flowers from Miss C. Mitchell, Blackwood; one parcel of flowers each from Kadina and Cummins from Mr. R. C. Smith; from Mr. W. J. Hill, 51 Hewitt Ave., Rose Park, a spray of Quandong; from Mr. E. Stansfield, York, a bunch of Sturt Peas grown by him, which were the only specimens in the show; an example of fasciation in plants of the Salvation Jane (*Echium* sp.) from Woodville, sent by Mr. Wilson, Croydon; fruiting specimens of the native currant (*Acrotriche depressa*) sent by Mr. L. H. Howie; a parcel of flowers from Mrs. S. How, Aldinga.

THE ANNUAL REPORT OF THE MICROSCOPE COMMITTEE.

The activities of the Microscope Committee of the Field Naturalists' Section extended throughout the year 1930, and the meetings maintained the usual regular attendance. Early in the year the Committee was approached by the President of the Legacy Club with a view to interesting the boys in microscopic matters. Mr. Harding, assisted by divers members, arranged a number of lectures that were well attended. As a result of these efforts it was felt by members of the committee that it would be fitting if the ordinary meetings of the committee were thrown open to any of the lads who were interested, with the result that a large number, in charge of Mr. Shepherd, attended regularly.

The Committee were fortunate in obtaining the services of Mrs. Best, of the University Staff. On one occasion a highly instructive lecturette was delivered on "Parasitology," and on another occasion the subject was "Single Belled Animalculæ." Both lectures were amply illustrated with slides and specimens. On the occasion of the latter lecture the Committee joined forces with the Aquarium Society, and a very large gathering was present.

Mr. Machell, of the Adelaide Teachers' College, was also kind enough to be with the Committee, and his evening on "Aquarium Life" was highly appreciated. An outline of Natural History as taught in the schools of the State was also given.

The thanks of the Committee are due to the Vice-President (Mr. W. A. Harding), who so kindly placed his microscopic projector at the disposal of the Committee. This instrument enabled large images of remarkable accuracy to be thrown on a screen, thus greatly facilitating the observation of the slides by the members.

(Signed) FRANK B. COLLINS,
Hon. Secretary,
Microscopic Committee.

ANNUAL REPORT OF THE SHELL COLLECTORS' CLUB.

There were 21 meetings during the year, with an average attendance of 12. At every meeting members brought shells for naming.

Interest in the objects of the Club continues strong, and large or small parties are constantly in the field. *Gastropoda* (univalves) have been under review, and the following families have been dealt with:—

Pleurotomariidæ.

Fissurellidæ.

Haliotidæ.

Stomatidæ.

Trochidæ.

Turbinidæ.

Liotidæ.

Neritidæ.

Acmaeidæ.

Members of the Club invite those who have an interest in shells to join with them on the first and third Mondays of each month.

(Signed) W. J. KIMBER, Chairman.

„ F. K. GODFREY, Hon. Secretary.

SHELL COLLECTORS' CLUB.

Members of the Section who are willing to make effort to become acquainted with our interesting Marine Mollusca, are invited to attend the meetings on the first and third Mondays. The Chairman (Mr. W. J. Kimber) will, at the opening of the meetings, gladly name shells which have been collected. Univalves are at present under review and during the quarter, Nerita, Limpets, Litorinas and Rissoas have been dealt with.

FAMILY NERITIDÆ.

Nerita melanotragus (Smith). This shell gives the idea of an intensely black winkle. It is the only representative of this family in our waters and cannot be mistaken for any other shell. Solid, almost globular, black on the back, the mouth is white and shines like porcelain. On the broad side of the mouth are two or three denticles which appear to hold the operculum, or trap door, in place. About an inch either way. Common on the shady side or under rocks between tide marks, spending considerable time out of water. Inactive by day, roaming at night feeding on algae, etc. Ranges from Western Australia to New South Wales. Tasmania and New Zealand.

FAMILY ACMAEIDAE (Limpets).

Genus Patelloida (Q. & G.). All the species have conical shells of the well-known limpet type, and although some are fairly elevated, some are almost flat; some species are oval, some approach the circular; the apex is more or less in front of the middle and is pointed forwards; the interior is not iridescent and there is generally an internal marginal border of colour. On rocks usually at about or above low tide mark.

P. alticostata (Angas). Oval, depressed, whitish, very wavy at the margin, with about 17 rounded ribs radiating to the circumference. Interior white and brown stained. $1\frac{3}{4}$ inches. Not usually found north of Pt. Willunga.

P. calamus (Cr. & Fischer). Colour variable but usually whitish within and without. Almost circular, with five radial thread lines. About $\frac{3}{4}$ inch.

P. cantharus (Reeve). At first sight the shell is smooth but a lens discovers radial sculpture. Shell oval, anterior slope concave; colour black or brown, blotched with white; interior light blue or light brown with the central area chestnut brown; the sharp margin having a rather broad brown border often dotted with yellowish brown. $\frac{3}{4}$ inch. Common at Port MacDonnell.

P. conoidea (Q. & G.). Fairly conical, wholly black, with a black marginal band within; the rest of the interior is white except for a little brown under the apex. Sculpture consists of about 16 radial thread-like ribs. $\frac{3}{4}$ inch. Pt. Willunga and farther south.

P. flammea (Q. & G.)? Oval, somewhat high with faint radial lines. Colour may be olive-brown, yellow, reticulated, and in straight or forked lines. Interior brownish. $\frac{3}{4}$ inch. Robe, Beachport.

P. marmorata (Ten-Woods). Oval to oblong, depressed, with from eight to eleven wide radiating ribs. Dull olive; interior shiny and variegated with white rays and black between them, also the middle black inside with a white margin. $\frac{3}{4}$ inch. Common, Pt. Willunga and farther south.

P. inradiata (Reeve). High, conical, dull white, without radial sculpture. Interior, the centre brownish is clouded with opalescent blue. As a beach shell the interior shows a Maltese cross. About 1 inch. Fairly common all coasts on rocks.

P. septiformis (Q. & G.). Oval, depressed (almost flat), with radiating riblets; brown, sometimes tessellated with green and white. Interior blue or whitish, lined with brown. $\frac{1}{2}$ inch. Common on rocks all coasts.

P. subundulata (Angas). Oval, thin, high, pale-horn colour, stained various colours; faint radial ribs. $\frac{1}{4}$ inch. Common.

FAMILY PATELLIDAE (Limpets).

Molluscs of this family of Limpets differ from Acmaeidae in the gills. The shells too are considered different in texture and lack a defined internal border. As with Acmaeidae, the apex is always in front of the centre. The central area (internal) and the muscle-scars are similar in the two families.

Genus Patella (Linne). Shell conical (Limpet), interior with a silvery and mica-like lustre.

P. perplexa (Pilsbry). Depressed, star shaped, with five large rounded ribs behind and three in front of the apex, reaching out beyond the margin. About an inch. Rather rare.

P. ustulata (Reeve). Dull yellowish-white with about 21 valid angular radiating ribs; interior shining ivory-white tinged with yellow. Common, on the vertical face of rocks just above low water mark. An inch or more. Encounter Bay to Port MacDonnell.

Genus Cellana (Adams). Oval, conic, with numerous obtuse elevated radiating ribs, crossed by dense concentric growth lines; margin more or less crenulated.

C. limbata (Philippi). Large, almost round, slightly pearly, yellowish or deep salmon, with from 30 to 37 ribs, broad, rounded, thickly often coarsely grooved with lines of growth; interior of a peculiar silky nacre, silvery, bluish-yellow or golden. 2 inches. Common, Encounter Bay and farther west.

C. variegata (Blainville). Roundly oval, a little narrowed in front, with rather fine radiating ribs, varied with about 10 black narrow rays; colour variable both outside and inside; interior may be any colour from pale indigo to golden; the silky lustre is constant. Up to 2 inches. Common all rocky coasts as far as Venus Bay.

C. stellaeformis (Reeve). Reddish or brownish, with four radiating ribs behind and four in front of the sub-median acute apex. 1 inch. Rare.

FAMILY LITORINIDAE.

Genus Melarhaphe (Menke)—*M. unifasciata* (Gray). Everyone knows the little bluish spiral shell, with a blue band around the middle of the large whorl which is whiter than the others; barely half an inch. Found on rocks which are only washed by the high tide.

Bembicium melanostoma (Gmelin) and *B. nanum* (Lamarck) are common pyramidal shells, melanostoma being the taller; about $\frac{3}{4}$ inch diameter, on rocks between tide marks.

FAMILY RISSOIDAE.

We have sixteen genera and more than forty species of this interesting round mouth vegetarian family; all are small, some minute. They live amongst the weeds in shallow water and are collected from shell sand on the beaches.

F. K. GODFREY,

Hon. Secretary.

OUR EXCHANGES.

1. Natural History Journal of the American Museum of Natural History. July-August Number.

Among the many splendidly-illustrated articles one on "Desert Roses," mineral forms akin to our own "barytes buns," will be of special interest to our members. There is a short illustrated article by the former Director of the Adelaide Museum, Mr. Edgar R. Waite, on "The Aboriginal Boomerang."

- 2 The Victorian Naturalist. October Number.
There is an interesting account of the Great Earthworm (*Megascolides*) of Gippsland.

FIELD NATURALISTS' SECTION OF THE ROYAL SOCIETY OF SOUTH AUSTRALIA, INC.

Statement of Receipts and Expenditure for Year Ended August 31st, 1930.

RECEIPTS.

	£	s.	d.
To Balance from last year	24	8	0
" Subscriptions	33	15	0
" Bank Interest	2	5	2
" Flower Show	39	8	4
" "S.A. Naturalist" Sales	0	6	8
" Badges	2	12	6
" Collection, Flinders Chase	1	2	0
	<hr/>		
	£103	17	8

EXPENDITURE.

	£	s.	d.
By Postages, etc.	6	15	0
" Printing and Stationery	26	13	6
" Advertising	3	6	0
" Hire of Hall and Lantern	6	18	11
" Badges	4	0	0
" Flora and Fauna Collection for Flinders Chase	1	2	0
" Library Books	0	19	0
" Travelling Expenses	1	12	7
" Royal Society	33	15	0
" Excursion Account Loss	0	12	9
" Bank Balance	18	2	11
	<hr/>		
	£103	17	8

(Signed) E. V. DIX, Hon. Treasurer.
Audited and found correct.

(Signed) WALTER D. REED,
Chartered Accountant (Aust.)

" WILLIAM H. BROADBENT,
Auditors.

Adelaide, 19/8/30

EXCURSION ACCOUNT.

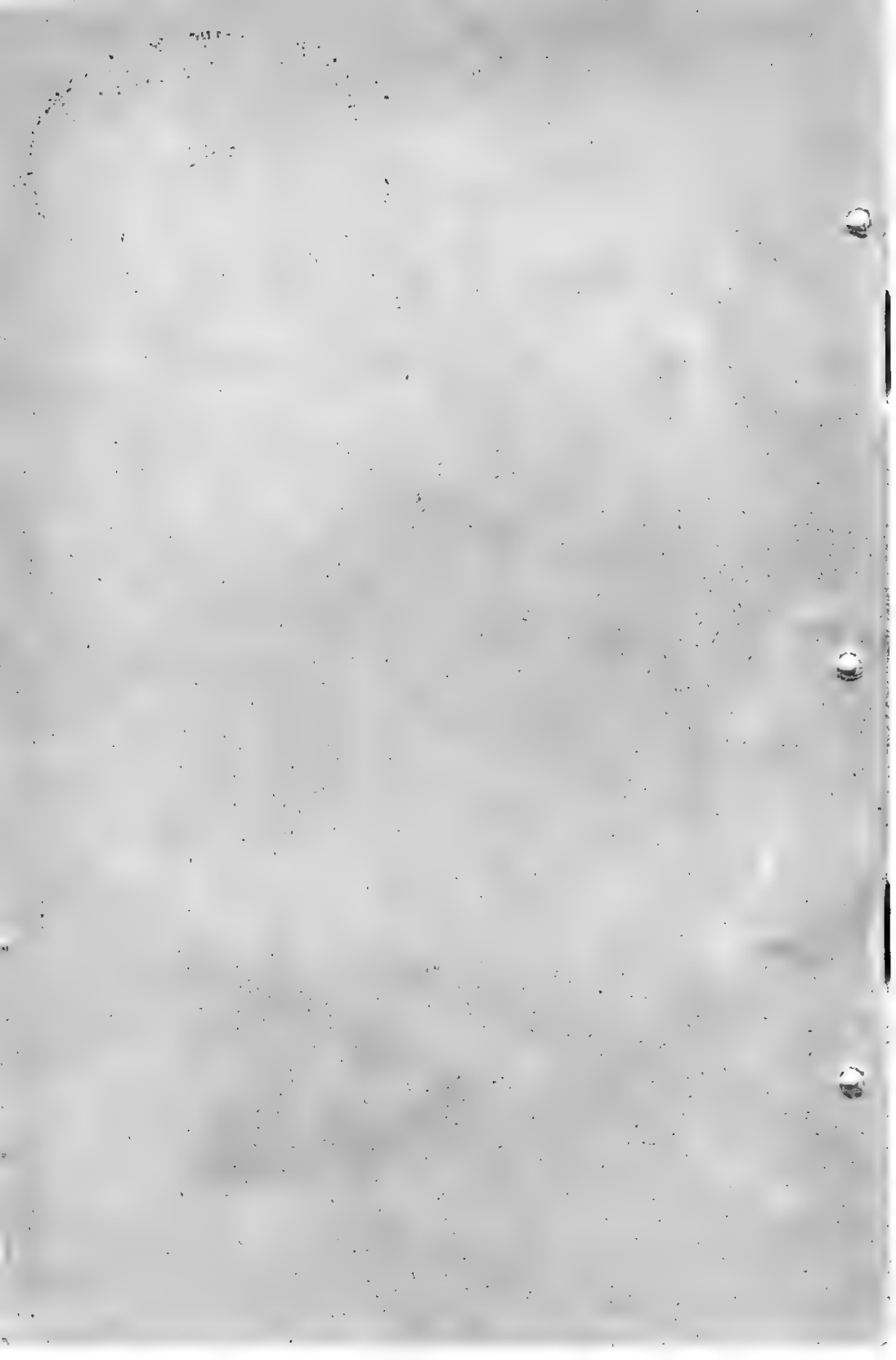
PROFITS.

	£	s.	d.
1929. Nov. 30. Basket Range Trip	1	0	0
Excess of Loss over Profit . .	0	12	9
	<hr/>		
	£1	12	9

LOSSES.

	£	s.	d.
1929. Sept. 7. Trip to Mr. Coull's	0	13	6
1930. Feb. 15. Launch Trip	0	19	6
	<hr/>		
	£1	12	9

(Signed) E. V. DIX, Hon. Treasurer.





The South Australian Naturalist

The Journal of the Field Naturalists' Section of the Royal
Society of South Australia and of the South Australian
Aquarium Society.

Adelaide



Feb., 1931

Vol. XII.

No. 2.

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The authors of papers are responsible for the facts
recorded and opinions expressed.

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Editor "South Australian Naturalist":
Mr. WM. HAM, F.R.E.S.

o

EXCURSIONS.

1931.

Mar. 21—Tram at 2 p.m. to Mr. Simon Harvey's, Kensington Gardens.
Aviculture. Mr. S. Harvey.

Apr. 7—Tram at 1.30 p.m. to Morialta. Geology. Mr. W. Ham.

Apr. 25—Train at 9.23 a.m. to Port Noarlunga. Shells. Mr. W. J. Kimber.

May 2—Train at 1.15 p.m. to National Park. Exotic Trees. Mr. W. H. Selway.

May 9—Tram at 2 p.m. to Dr. A. W. Hill's, Fullarton. South Sea Island Exhibits. Dr. A. W. Hill.

o

LECTURES.

Mar. 17—"Europe in 1930." By J. M. Black.

Apr. 21—"Ancient Astronomy." By Dr. B. G. Maegraith, M.B., B.Sc.

May 19—"A Chat on West Australian Wild Flowers." By Mr. Edwin Ashby.

* These Lectures will be given with Lantern Slides in the Lecture room.
Business Meetings will commence at 7.30 p.m. and Lectures at 8 p.m.

The South Australian Naturalist.

Vol. XII.

ADELAIDE, FEBRUARY, 1911.

No. 2.

ABORIGINAL RELICS IN THE BLINMAN DISTRICT.

By P. STAPLETON.

ROCK CARVINGS.

During a holiday trip to Blinman in May, 1930, the writer, desiring to investigate aboriginal relics, questioned natives camped in the district. "Larrikin Tommy," an aged Angorigina native, knew of the existence of rock-carvings near Blinman. These were found to be situated in the seventh bend (approx. one mile) up the creek from "Glass Hut and Windmill," which is about 5 miles N.W. from Blinman on the old road to Parachilna. The creek is not shewn on the Pastoral Plan, but is known locally as Harry Thyer's creek. At the place concerned there is what



ABORIGINAL ROCK-CARVINGS NEAR BLINMAN.

was considered to be a permanent waterhole, but owing to the drought conditions prevailing the bed of the creek showed only slight signs of dampness. The creek has cut into the slaty rock of the hillside and formed a cliff facing east and varying in height from 3 feet at the northern to about 50 feet at the southern end. Carvings were distributed along this for a distance of 150 feet.

These carvings have an appearance of greater age than any the writer has seen elsewhere. This is in direct contrast to some about 5 miles distant on the Oratunga Creek recorded by Mountford (1), who states that "some of the intaglios shewed no surface colouring whatever. being the same colour as the adjacent rock surface when the patination was scraped away." The rock, including the carved portions, has weathered till it has a uniform sooty appearance which makes the majority of them difficult to see; in fact some appeared in the photographs which were not noticed at the time they were taken. In most cases only by careful chalking could the figures be properly appreciated. No signs of superimposing could be detected. The greater number were of unusual design, consisting of lines, loops and enclosed and unenclosed spaces of irregular form, often joined up to the design by wavering lines and with portions shaded in by punch marks, the whole forming a confused pattern. Only a few examples of animal and bird tracks were observed and these were in all cases deeply incised. All the "tracks" noticed are shewn in text figs. 4 and 6. On some parts of the cliff face which had been carved, the rock has broken away owing to the undermining influence of the creek, leaving the figures incomplete.

One originally smooth vertical slate surface about eight feet square has become much fractured so as to present a tessellated appearance. This surface had formerly been totally covered with designs apparently similar to figs. 1 and 2. Six circles ranging from about 18 to 30 inches were seen towards the southern end. Owing to the erosive action of the creek on the base of this cliff some carvings are now in positions which could not be reached except with a ladder or other artificial aid.

Aleck Ryan, an aboriginal from Mt. Searle, whose aged father Sidney Ryan (Wanjulda) is known for his great knowledge of native mythology and ceremonials, spoke to me of localities where rock-carvings exist, and remarked "They about our religion like you people have religion."

A search was made for other relics of the people who were responsible for these examples of primitive art. The gentle pine clad slope on the opposite bank of the creek facing the cliff was

searched; no ovens or other relics, except a few primary flakings of white flint, were found. The latter, however, can be seen at intervals along any of the numerous creeks in this part of the Flinders Ranges. Many permanent waters were visited and at some of them far smoother and apparently more suitable rocks for carving exist, but none of them are carved. This suggests that considerations other than the suitability of the rocks governed the selection of the locality. A close examination with a magnifying glass of the intagliations shews them to have an inverted wedge-like shape, which suggests that rock crystals may have been the tools employed in their execution; indeed nothing which the natives could have used would appear to have been more suitable for this purpose. The writer once made a careful search at Yunta Springs and Salt Creek (where vast numbers of carvings cover the rocks) for implements with which they had been executed, but nothing could be found. If, as Basedow (2) believes, these carvings are of great antiquity they might well be buried beneath the surface of the ground.

ABORIGINAL STONE STRUCTURES.

The writer sought information from Ryan regarding "Aboriginal Stone Structures" similar to those described by Mountford (3) and to that end shewed him a photograph of one situated on Weroonee Range and asked—"Do you know what these are?"

He replied that they were built by natives "just for lark, no use," and said they were called *yuraka*. These are commonly alluded to by white residents of the Blinman district as "native trigs." A visit was paid to Mr. Henry's Alpina Run. Four *yuraka* are situated here (about eight miles south-west of Blinman). Three are on top of a high range running east and west. Two are situated within 300 yards of each other and a third about half a mile westward of these. They were built of slate and are square in plan. Yet another was seen low down on a hillside across the valley which is approximately half a mile wide. It differs in being conical in shape and very compactly built of blocks of sandstone, of which the hill is composed. It is five feet six inches in height. Whilst on a tour through the Northern Flinders Ranges three years ago I noticed similar conical structures at various points along the route.

PITFALLS.

Ryan also told me that pitfalls called *verta* (the r is elided) had been in use among the aboriginals of his part of the country and said they could be seen on the Wertaloona station. Any of his people would point them out. A pit was dug and edged with slabs of stone. When in use this pit was covered with boughs of trees and served for catching Euros and Wallibies. Mr. N. B. Tindale says that he has heard of the existence of native pitfalls in Western Australia.

WATER SIGNS.

Ryan volunteered the information that groups of small stones placed together were a native sign for water. He stooped down and drew together stones about the size of walnuts forming a patch about 9 inches in diameter and remarked "just like that."

I gathered from him that this water sign was placed on a native track as an indication to others that a temporary water hole was present nearby.

Mrs. Lyford, of Blinman, kindly used her influence with the aboriginals camped at Parachilna Gap and helped me to obtain information; Master Jack Roberts acted as guide and lent his assistance in making tracings, and Mr. J. P. Henery escorted me to the "Stone Structures" on his father's property.

REFERENCES CITED.

- (1) Mountford, C.P., Report Aust. Assoc. Adv. Science, Hobart, 1929.
- (2) Basedow, H., Journ., Roy Anthropol. Inst., xliv., 1914, pp. 195-211, pl. i.—xiii.
- (3) Mountford, C. P. Trans. Roy. Soc. S. Austr., LI, 1927, pp. 169-172, pl. IX.-X.

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THE FEATHERED ORCHESTRA.

Thank heaven this inspiring music has not, like the bands in our theatres and cinema halls, succumbed to the imported canned article. Just as light is breaking in the East a pair of blackbirds near our backyard regularly every spring open the performance with an exquisite duet. In the pear tree at the back of my room the cock bird pours forth an ecstasy of delightful flute-like notes for some minutes, and faintly in the distance comes the response of the plain little brown hen. This strophe and antistrophe is kept up for something like an hour when the male bird flies away in a northerly direction evidently accepting his mate's pressing invitation. The next item is the liquid gurgling carol of a magpie who pours forth his soul in a transport of melodious song from

the top of a neighbouring lofty gum. This is followed by the sweet little musical solo of one "Silver Eye," one of the faintest of bird calls, coming from a nearby pepper tree and the little bird may be seen at work among the red berries. From a stately peach tree comes in a flood a burst of little sharp notes close together. Passion and force give a rude rhythm to the strain. It is the Blue Wren in full wooing song. The harsh twitter of the sparrow and the raucous call of the starling, by their discord, serve to intensify the general harmony. What do these rich varieties of song express? At one time it was believed that their only meaning was love and courtship just as among the human species the voice is richest and most thrilling on like occasions. But, as with us, many other emotions and sentiments may be expressed in song. High spirits find a natural outlet in bursts of melody or the reverse, as witness the human male at the bath. It also seems to be well established by careful observation that birds do communicate their thoughts and feelings by their songs and cries. Perhaps, too, they sing from the mere "*joie de vivre*" (joy of life) as in the old days one might hear men and women in orchard, meadow or cornfield, express their delight in congenial work. It seems then that these songs are not erratic and formless effusions. Peculiarities of song are more easily detected in field or wood than trifling points of plumage or form. The characters of musical notes are as distinctive of families or groups as those of feature or structure. As I write my ears are saluted by a delicious flood of liquid notes which without further test I am sure come from the piping crow shrike. Birds have many characteristics in common with men and in some respects are nearer to us than our truculent repulsive cousins the apes. Even more warm blooded than ourselves they are accordingly even more independent of climatic restrictions. They conquered the air for locomotion long before us and far more effectively, facts which give them an independence of place and time superior to our own and ensuring for them considerable spells of leisure which they devote to elevating forms of recreation. They have an education system of a simple and effective kind, based, as ours is rapidly ceasing to be on family life and parental responsibility. They have an aesthetic sense and express their emotions in song and dance and displays of finery. One closing fact might be noticed that like poets and thinkers their finest outbursts are conceived in solitude. Birds that go in flocks like sparrows or starlings rarely sing. These latter birds are too busy exchanging the gossip and scandal of the day to find time to soar into snatches of song.

SHELL COLLECTORS' CLUB.

The Club is in recess until Monday, 2nd March. In the following notes on shells recently dealt with, those genera have not always been described which have but one or two species. To economise space and avoid repetition, it is suggested to read the description of the species together with the remarks on their genus and family. The numbers on the extreme right refer to Sir J. C. Verco's Catalogue of Marine Mollusca of South Australia, 1908.

The illustrations are original drawings of the shells by Miss J. M. Murray, a prominent member of the Shell Club. The Section is greatly indebted to Miss Murray for having so generously given of her talent and her time.

—:O:—

Family RISSOIDAE (in part).

This is a very extensive tribe of tiny shells, with representatives in all seas, mostly in coastal shallow waters, frequenting algae, zostera and other plants, on which they subsist, and from which they often suspend themselves by a mucous filament. The mouth of the shell is more or less round, as is usual with almost all molluscs which subsist on plants, and is never truly channelled in front. Some species are smooth, some ribbed, some criss-cross. The operculum is horny and few spiral. The family is named after Risso, a French zoologist, and more than 500 species have been made known to science. Our most common species are:—*Diala lauta*, *D. picta*, *O. monile*, *D. translucida*, but a careful search in shell sand, from various beaches, with the aid of a lens, will discover many others.

Genus DIALA (A. Adams, 1861).

Shell small, thin, oval-conic; spire elevated, tapering; whorls rather flat, smooth or spirally striate, last whorl somewhat angulated at its greatest diameter; base convex; mouth oval, jug spouted at lowest extremity; outer lip simple, inner lip slightly angulated in the middle. Australasia, Japan, Philippines. Not many species known.

D. imbricata. (A. Adams. 1862. Alaba.).

A pretty species, slightly turreted, white, here and there tinted red, with 7 flat, imbricated whorls, faintly spirally grooved. Height $\frac{1}{4}$ x 1-12 inch. Fairly common. Gulf St. Vincent.

- D. lauta.* (A. Adams. 1862. Alaba). 300.
= *D. punctata* (Ten-Woods) = *D. magna* (Tate).
Fig. 1.

Whitish, girdled with numerous reddish spotted lines. The 7 flat whorls are faintly spirally grooved, and the last whorl is distinctly angulate at its greatest circumference. With most beach specimens the spiral grooves and punctate markings are worn away, leaving the shell smooth and snowy white. Height 1-3 x $\frac{1}{8}$ inch. Very common in shell sand. Gulf St. Vincent and Spencer Gulf.

- D. monile...* (A. Adams. 1862. Alaba). 298.
= *D. tessellata.* (Ten-Woods).
Fig. 2.

A pretty white elongated-conic shell with a necklace-like row of red spots winding round the whorls. Height 1-3 x $\frac{1}{8}$ inch. Fairly common. Gulf St. Vincent.

- D. pagodula.* (A. Adams. 1862. Alaba).
Fig. 3.

A thin, white species, shaped like a little pagoda and adorned with reddish-brown markings. Whorls encircled in the middle with a series of plicate nodules. Height $\frac{1}{4}$ x 1-10 inch. Not uncommon. Gulf St. Vincent.

- D. picta.* (A. Adams. 1861). 299.
Fig. 4.

Elongated-conic, smooth, shining, white, with 6 flat whorls, ornate with a spiral row of rufus blotches just below the sutures; apex violet. Height $\frac{1}{4}$ x $\frac{1}{8}$ inch. Common, Gulf St. Vincent.

- D. pulchra.* (A. Adams. 1862).
Fig. 5.

An elongated-conic, thin species, handsomely painted with rufus, and the whorls nodosely plicate at the sutures. Height, $\frac{1}{4}$ x 1-10 inch. Not very common. Gulf St. Vincent.

- D. translucida.* (Hedley. 1905).
Fig. 6.

A beautiful tiny shell, oval-conic (variable proportionately), glossy, very thin, transparent enough to see the axial pillar through the whorls; whorls 9, regularly tapering, a row of opaque spots often on the large whorl and sometimes lightly criss-cross with reddish-brown. The straight columella separates it from Eulima or Stylifer. Height, 1-6 x 1-16 inch. Fairly common. Gulf St. Vincent.

D. varia. A. Adams. 1861. Alaba). 301.

Oval-conic, thin, reddish, painted fuscus and black; 7 flat whorls; base convex, faintly grooved; mouth oval, outer lip arched, inner lip almost angulated in the middle. Closely related to *D. lauta* and may often be picked out from small examples of that species. *D. varia* is the type species of the genus and occurs also in Korea and Japan. Height 3-16 x 1-16 inch. Not uncommon. Gulf St. Vincent.

Genus *CITHNA*. (Adams. 1863).

C. angulata. (Hedley. 1907).

This species appears to be frequently taken in the dredge at moderate depths, but is not considered a beach shell. About 1-10 inch high, conical, thin, polished, narrowly umbilicated; five whorls, compactly coiled, rather flat; sutures deeply impressed. A sharp elevated cord accentuates the peripheral keel, above it and on the spire are a few faint, irregular radial ribs. Colour from milk-white to glassy. Mouth somewhat pear-shaped; base rounded.

Family ASSIMINIIDAE.

Shells of this tribe usually inhabit brackish water and estuaries. The beach student will probably find *Assiminia brazieri*, although it is not common, but *A. tasmanica* is rarer.

Genus *ASSIMINIA*. (Leach. 1820).

Shell oval-conic, somewhat solid, umbilicus minute and nearly hidden; whorls smooth, sloping convex, obtusely angular at base; mouth oval, entire, inner lip thickened, outer lip acute. Operculum horny, with few spirals.

A. brazieri. (Ten-Woods. 1875. Rissoa).

Fig. 7.

Whitish, somewhat clouded with a deep olive periostracum, having one broad tawny-yellow spiral band; whorls 5, rounded, smooth, angulate at greatest diameter; mouth rounded, angular above. Height, $\frac{1}{8}$ x 1-12 inch. Not common, estuarine conditions Outer Harbour, entangled in the conserved growth on rocks.

A. tasmanica. (Ten-Woods. 1875).

= *Rissoa siennae* (Ten-Woods) = *A. bicincta* (Petterd).

Turbinately-conical, solid, smoky horn colour, banded with dark brown, with a thin olive periostracum; whorls 5, convex, obtusely angular near the base; mouth pear-shaped, columella with a thick, shining, tawny callus; interior tawny. Height, 1-6 x $\frac{1}{8}$ inch. Uncommon. Look for this under sticks and stones and on weed near high water mark in mangrove swamps.

Family HYDROBIIDAE.

A tribe of small oviparous molluscs; some species living in fresh, others in brackish water. We have but one representative which is uncommon, but nevertheless a possible find by beach collectors.

Genus *TATEA*. (Ten-Woods. 1878).

Named in honour of the late Professor Ralph Tate, F.G.S., F.L.S. *Tatea rufilabris* being the type.

T. rufilabris. (A. Adams. 1862. Diala).

= *Bythinia huonensis*. (Ten-Woods).

rufus = red. labrum = lip.

Fig. 8.

Elongate-pyramidal, rather solid, shining, straw coloured, with orange colour round the mouth; spire elevated, whorls about 7, rather flat, without ornamentation; mouth pear-shaped, inner lip reflected. Operculum shelly. Height, 1-6 x 1-16 inch. Uncommon. Brackish water. Field River (Hallett's Cove). Port Lincoln.

Family TRUNCATELLIDAE.

Amphibious molluscs, inhabiting the margins of streams, salt marshes, damp places, etc. Some conchologists consider that this tribe connects with the typical operculated land shells—the Cyclostomae. Of our species, *Acmea scalarina* and *A. marginata* are very common in places. *Coxiella badgerensis* is common in certain localities as a fossil.

Genus *ACMEA*. (Hartmann. 1821).

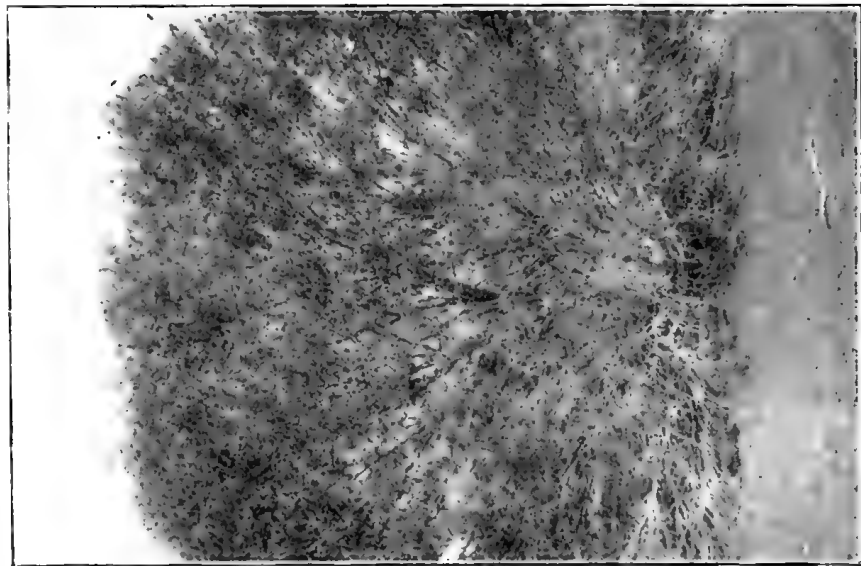
A. scalarina. (Cox. 1868. Truncatella). 329.

= *Truncatella tasmanica* (Ten-Woods).

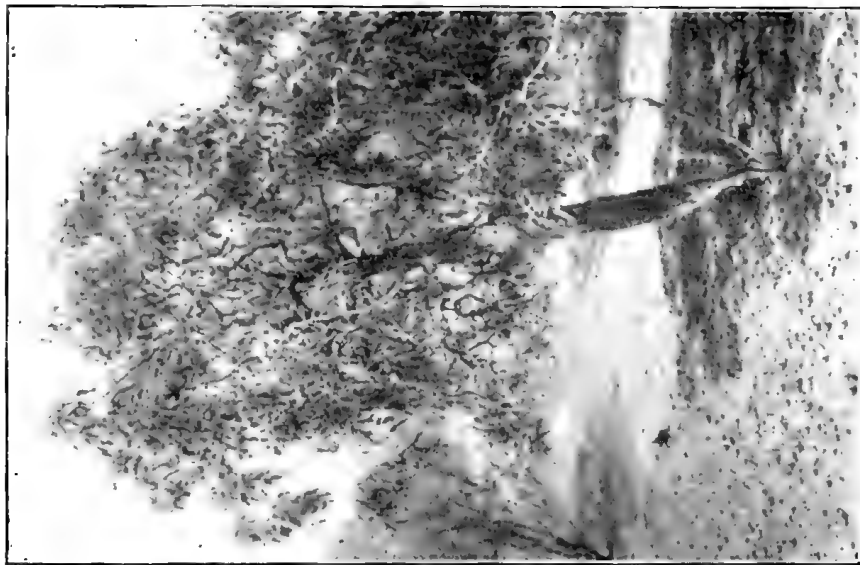
Usually decollate (beheaded), cylindrically turreted, small, thin, shining, pale fulvous (beach examples white), whorls 5 (if not decollate 7), somewhat convex, thickly set with longitudinal plaits (30-35 on last whorl); mouth pear-shaped, outer lip slightly expanded, inner lip reflected. Operculum very thin, transparent, with few spirals. Height, $\frac{1}{4}$ x 1-10 inch. Very common, Outer Harbour. Easily recognised by the broken off apex and cylindrically-turreted form.

A. marginata. (Kuster. Truncatella). 330.

Fig. 9.



Duboisia Hopwoodii F.v.M.
(Pituri). A Prison Bush.
Bellamy's Well.
Photo by L. Julius.



Eucalypta acuminata
(R. Br.) Spr. et Summ.
Parakeelya.
Photo by E. Julius.

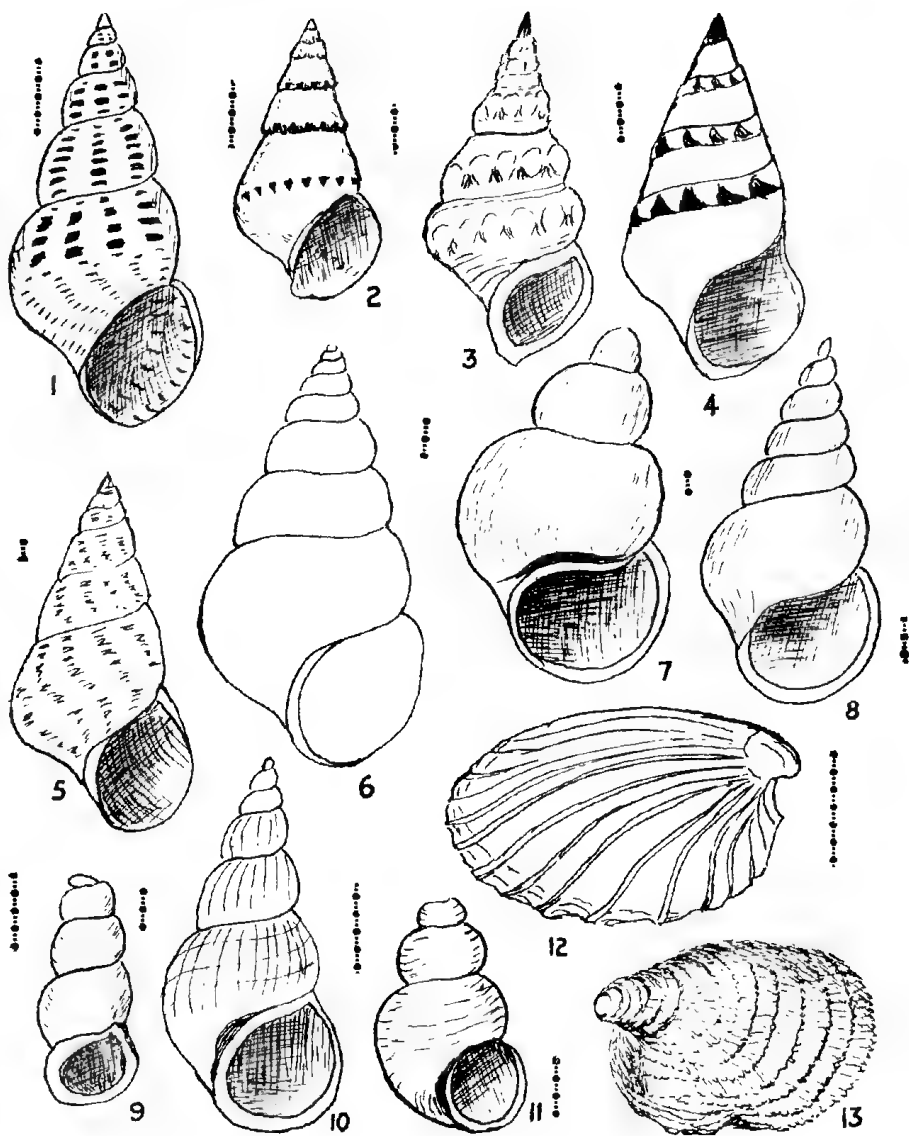


Fig. 1. *Diala lauta*.
 Fig. 3. *Diala pagodula*.
 Fig. 5. *Diala pulchra*.
 Fig. 7. *Assiminia brazieri*.
 Fig. 9. *Acmea marginata*.
 Fig. 11. *Coxiella gilesii*.
 Fig. 13. *Hipponix foliacea*.

Fig. 2. *Diala monile*.
 Fig. 4. *Diala picta*.
 Fig. 6. *Diala translucida*.
 Fig. 8. *Tatea rufilabris*.
 Fig. 10. *Coxiella badgerensis*.
 Fig. 12. *Hipponix conicus*.

Marks or lines showing actual size.

This shell is quite smooth; it is not quite so large, but in other respects is very similar to *A. scalarina* and is found together with that species. Some conchologists are of opinion that these two shells are but varieties of one species.

Genus *COXIELLA*. (E. A. Smith. 1898).

= *Blanfordia*. (Cox. 1867).

C. badgerensis. (Johnston. 1878. Pomatiopsis). 331.

= *C. confusa* (Smith = *Blanfordia striatula* (Cox).

Fig. 10.

Pyramidal, generally decollate (beheaded), thin, scarcely opaque, pale orange colour, inside tinted reddish-brown; whorls (not decollate) 7, subsequent average 5, moderately convex, criss-cross with irregular raised lines and indistinct varices; suture deeply impressed; mouth elliptical, margin somewhat thickened, inflated and reflected. Height, 2.5 x 1.6 inch. The type was a fossil from Badger Island (Tas.). Prof. Howchin (R. Soc. S.A. —1900, p. 9) states "this species may be regarded as ubiquitous in its distribution over the marginal maritime belt of Southern Australia, under brackish water conditions, as well as in many of the isolated lagoons in inland positions." Again (1910, p. 6): "Between Encounter Bay and the R. Inman there are low lying flats of recent origin In these flats are deposits of white to dark coloured marlstones, consisting largely of the brackish water shell, *C. badgerensis*." Fresh shells are taken at the Outer Harbour (Snowden's Beach).

C. gilesii. (Angas 1877. Paludinella). 332.

= *Blanfordia stirlingi*. (Tate. 1894).

Fig. 11.

Globosely-turbinate, very narrowly umbilicated, thin, pale orange colour, with here and there narrow transverse lines of a dark colour, with very fine growth lines; whorls 5, very convex; suture impressed; mouth elliptical. Height, $\frac{1}{4}$ x 1.6 inch. Angas' type was from the shores of Lake Eyre. Tate's type was a fossil from osseous clay at Lake Callabonna. Mr. Kimber has taken fresh shells at Outer Harbour.

Family HIPPONICIDAE.

Hippos signifies a horse, onyx a hoof, in allusion to the horse-shoe shaped scar formed by the attachment of the mollusc to its shell. The distribution of the family is limited to warm seas. Of our species, *Hipponix conicus* is very common and within the reach of every young student. *H. foliacea* is not so common.

Genus *HIPPONIX*. (Defrance. 1819).

Shell thick, obliquely conical, non-spiral, apex somewhat posterior and directed backwards, surface somewhat rough and rugged, or longitudinally grooved; muscular impression horse-shoe shaped.

H. conicus. (Schumacher. 1817. Amalthea). 302. 303.
= *H. australis*. Q. & G. 1835).

Fig. 12.

Solid, conical, with strong radiate ribs and narrow spaces between them. Colour varies from greenish-white to reddish-brown; interior like porcelain, greenish-white, central area may be any shade from red to green. Mouth scarcely round, margin sharp, uneven, sometimes milled. Height, anything up to $\frac{1}{2}$ x 1 inch. Very common. Parasitic on other shells, remaining fixed after death. Specimens from Corney Point and other ocean beaches appear thinner and lighter than from beaches near Adelaide. Fossil in the Pliocene, Hallett's Cove.

H. foliacea. (Q. & G. 1835). 304.
= *Capulus antiquatus*. (Linne).

Fig. 13.

Smaller than *H. conicus*, with concentric foliations (leaf-like, layer on layer) crossed by radial thread lines; colour white with a brown periostracum in shreds. Height, 1-3 x $\frac{1}{2}$ inch. Fairly common on exposed rocks on ocean beaches.

Genus *CHEILEA*. Modcr. 1793).

"Cup and Saucer limpet."

Conical, scarcely circular: apex central, acute; cavity regular, conical, with a folded plate at the top of the cavity, free from the sides.

C. undulatus. (Martyn).

C. equestris var *cephacea*. (Broderip. 1835). 308.

White, almost round, somewhat thin, with numerous somewhat corrugated striations; interior shining; cyathi (interior "cup or ladles") with pointed terminals in front. Height, $1\frac{1}{2}$ x $1\frac{1}{2}$ inches. Somewhat rare. Wallaroo. Adhering to other shells in fairly deep water. Not often found on beaches.

F. K. GODFREY, Hon. Sec.

Illustrations.—Original drawings of the shells by Miss J. M. Murray.

DESCRIPTION OF THE FLORA BETWEEN PORT AUGUSTA AND TARCOOLA.

By J. BURTON CLELAND, M.D.

At the end of October and beginning of November, 1929, through the courtesy of Mr. E. Julius, the Conservator of Forests, I had an opportunity of accompanying him during an excursion N.W. of Port Augusta in search of Sandalwood, *Eucarya* (*Fusanus*) *spicatus*, and of *Santalum lanceolatum*. Notes were made of the botanical features seen and part of these, together with a list of the plants identified, formed a paper published by the Royal Society of South Australia in their Proceedings for 1930. The present notes gives a short botanical description of the country traversed and also an extract showing how a botanical survey can to some extent be made whilst travelling by motor car.

I.—GENERAL DESCRIPTION OF THE FLORA BETWEEN PORT AUGUSTA AND TARCOOLA AND TO THE WEST OF LAKE TORRENS.

The country between Port Augusta and Tarcoola, a distance by road of 471 miles and by rail of 516 miles, may be stated to consist of two different types of country, the Myall-Mulga-Myoporum-Bluebush sand to sandy loam, sometimes gravelly or with loose stones; and the stony table-lands with soil covered with small or large loose, mostly flat, "gibbers," often showing the desert glaze when the sun falls on them obliquely. This latter type is treeless except for an occasional Mulga amongst the stones, or in depressions or sandy hollows a vegetation like that of the Myall-Mulga type. On the other hand, the first-named association is not always tree-covered.

(1) THE MYALL-MULGA-MYOPORUM-BLUEBUSH-SALTBUSH ASSOCIATION.

Throughout the route followed, the predominant features may be said to be the prevalence of various species of Mulga with, in parts, Myall as well. Interspersed between these there may be Bluebush and Saltbush. Where, however, table-lands present themselves, as between Lake Windabout and Lake Hanson, the Mulga is quite absent or appears as an occasional oasis or as isolated trees in depressions or even amongst the gibbers.

A few Myall trees (*Acacia Sorodenii*) may still be seen quite close to Port Augusta. Some fourteen miles north the Myall is the predominant tree with some *Myoporum platycarpum* (False Sandalwood), Bullock-bush (*Heterodendron oleifolium*), the rigid intricately branched leafless *Exocarpus aphylla* (a native cherry), the Native Peach (*Fusanus acuminatus*), true Sandalwood (*Fusanus spicatus*) and other trees and shrubs. Here and there are scattered Black-oaks (*Casuarina lepidophloia*) established on sandy ridges. Occasionally are seen Native Pines (*Callitris glauca*) in sand. Mulga is not so abundant quite near Port Augusta, but soon becomes so and continues thus throughout the route traversed. Beneath and between these trees and shrubs Bluebush (*Kochia sedifolia*) and perennial Saltbush (*Atriplex* sp.) grow.

Myall continues to be fairly common until Lake Windabout is reached, about 90 miles from Port Augusta, at which point, near Wyrappa railway station, the table-lands are reached. After passing these, which extend for over 70 miles, Myall is again seen west of Lake Hanson. Here it is still a prominent feature, though the Mulga is more abundant, and it continues prominent through Coondambo to Kingoonya. Between Kingoonya and Wilgena, about 41 miles, it is absent, or nearly so. The Myall is scattered on the Tarcoola Commonage to the north-west of Tarcoola and on the adjacent part of Wilgena Station. It disappeared from our route about 20 miles north-west of Tarcoola, but appeared again between The Twins and Mount Eba Stations. Between Mount Eba and Mount Vivian it was becoming a prominent feature and continued to be such through Parakeelya. It was absent, of course, from the tableland country of Andamooka and Arcoona.

The Mulgas are of several different species, differentiated by their general appearance, the shape (round or flat) and length of the "leaves" (phyllodes), the distance between the phyllodes, and the breadth of the pods and whether or not they are constricted between the seeds. Some grow on sandy loam, others on the more bare sand. Some form small trees, others appear as spreading shrubs. They are recognised as "Mulgas" by the flower-clusters being in elongated spikes not in globular heads. Some of the species are recognised as good fodder, others as indifferent.

The Myall is in places, especially near Port Augusta, heavily infested with a mistletoe (*Loranthus quandang*). In places the Mulga was also infested with a species of mistletoe. We saw

some Mulga trees heavily parasitised and dying as the combined result of the mistletoe and the drought. Advantage would be derived if as far as possible stockowners pulled off or cut out the mistletoe, which in these times of drought would furnish food for stock and the trees themselves would benefit by the removal of the parasite.

The species of plants met with amongst the Myall-Mulga association comprised amongst others the following:—*Myoporum platycarpum*, *Exocarpus aphylla*, Bullock-bush, *Cassia phyllodinea*, Native Peach, Sandalwood in places, Dead-finish (*Acacia tetragonophylla*) (sometimes in thickets), *Acacia Victoriae*, *Acacia Oswaldii*, Apple Acacia (localised), Black-oak, Bluebush (*Kochia sedifolia*), *Atriplex* (perennial), and Broom-bush (*Templetonia egea*). In the sandy loam after rain come up a number of small composites, *Stipa* grasses, members of the cress family, annual saltbush, the prickly *Bassias*, etc.

In places we may find open patches without trees and covered with Bluebush or Saltbush or the two mixed together. Such patches may be a few acres to perhaps a mile or so in extent, and round such patches trees appear at first singly, and then in greater numbers.

(2) THE STONY TABLELANDS.

In times of drought, the stony tablelands look very bare. The stones themselves vary in size and angularity and even in colour. Sometimes the majority are small, in other places they may be on an average 6 inches or more in diameter. Sometimes more than half of the soil is covered by the stones, in places they are wider apart. The stones must play an important part in conserving the water, not only immediately under them, but by the shades they cast. On the tablelands at Andamooka, for instance, after summer rains, the stones, and apparently Saltbush, are hidden by an abundant growth of Mitchell grass (*Astrebla* sp.) looking, it is said, almost like a field of corn.

During our trip the tablelands were very bare. Here and there occasional Mulgas might be seen, and little sandy areas intervened in places carrying the usual Mulga vegetation. For the most part, however, the tablelands were bare, save for the stones and the dead-looking branches of Saltbush.

Frequently slight depressions are met with on the gibber-covered surface into which water runs after rain. Often these show a growth of low Samphire. In other depressions where the water remains longer we may find some bushes of *Lignum*

(*Muehlenbeckia Cunninghamii*), or Swamp "Cotton-bush" (*Chenopodium nitrariaceum*). Such little swamps may also be met with interspersed in the Mulga country. Where a few drops of rain had fallen they bore some annual species of *Atriplex* and species of *Bassia*.

At Andamooka Station we came amongst the gibbers on a small depression 12 feet in diameter, an area which is locally called a "crab hole." In this small area no less than twenty different plants had come up as a result of a little rain. These included six grasses, amongst them Mitchell grass and a Love grass, and the following:—

Some dwarf plants of *Lotus australis* var. *parviflorus*, the prostrate possibly poisonous *Euphorbia Drummondii*, the native carrot (*Daucus glochidiatus*), one of the mallows, *Plantago varia*, a *Goodenia*, an *Atriplex*, Buck-bush, a *Bassia*, three composites, a *Calotis*, and a Crane's-bill or native geranium (*Erodium*).

(3) THE MULGA SCRUB NORTH OF TARCOOLA.

Between Bore No. 10 (80 miles north of Tarcoola) where we camped and the Vermin Gate turning in towards McDouall Peak Station, 21 miles, the country varies, but in places there were numbers of Mulga and other small trees and undershrubs. The camp was in a typical dry "swamp." In the pan of the swamp grew scattered bushes of *Chenopodium nitrariaceum* up to 6 ft. high, upright growing shrubs locally called "Swamp Cottonbush." In some of these swamps *Lignum* (*Muehlenbeckia Cunninghamii*) also grows. In one were a few plants of *Morgania glabra* with young flowering shoots untouched by the rabbits. Round and over the edge grew several species of Mulga, others in the sand round the raised rim. A few of these were in full bloom (unscented), others were passing into fruits. *Melaleuca uncinata* (used as a fence at The Twins Station) grew round the rim as scrambling shrubs up to 4 feet high with papery bark. *Salsola kali*, *Euphorbia Drummondii*, two species of *Kochia*, a perennial *Atriplex* and *Enchylaena tomentosa* grew in or near the edge. On the sandy rim were a number of Native Peaches (*Fusanus acuminatus*), some in fruit, a few *Cassia eremophila* in flower, shrubs of *Eremophila scoparia*, and Native Box-thorn (*Lycium australe*). Such swamps were met with here and there, readily recognised by the *Chenopodium* in the centre and the *Melaleuca* round the edge.

In places there were burnt patches of Mulga, mostly dead from a fire six years or so ago. Evidently grass had enabled the fire to spread. Under and between these trees the ground was mostly bare.

Other patches consisted of several species of Mulga, of which a very broad-leaved form was quite local, *Grevillea* with a handsome loranth (*Loranthus gibberulus*), a few *Hakea leucop-tera*, Quandang (*Fusanus acuminatus*) and Black-oak (*Casuarina lepidophloia*) often on the sand ridges, but no Myall. Sometimes perennial Salt-bush (*Atriplex* sp.), sometimes Bluebush (*Kochia sedifolia*) grew under or between the Mulga and other shrubs with occasional bushes of *Eremophila Duttonii*, *E. rotundifolia* (curly leaf), *Pittosporum phillyrcoides*, an *Acacia* like *A. ligulata* but with spikes of flowers, etc. Sometimes the *Atriplex* or the Bluebush or both grew for several acres free from trees, containing a mixture of perennial Saltbush and Bluebush with a number of other shrubs such as the curly-leaved *Eremophila*, or other species of *Kochia*, a pinnate leafed *Dodonaea*, the butts of dry grass, *Eremophila scoparia*, *E. Duttonii*, very green bushes of *Acacia Oswaldii*, etc. A little rain at the Vermin Gate had brought up Parakeelya (*Calandrinia remota*) with its purple flowers and white centres—sometimes a dazzling sight.

After entering the Vermin Gate, we saw that the effects of a fire some years ago, together with stocking and the drought, have had a disastrous result. Much of the Mulga was dead with nothing to replace it. From the Gate to McDouall Peak Station (16 miles), to The Twins (32 miles), Mount Eba (22 miles) and Mount Vivian (19 miles)—a total of 89 miles—we passed through miles of burnt or dead or dying Mulga, with open bare patches of blackish ironstone gravel, or small gibbers, or occasionally open spaces of perennial Saltbush or Bluebush, or occasionally dry swamps. A variety of shrubs was almost absent. One Myall was seen 20 miles north of west from Mount Eba. Some clumps came in between Mount Eba and Mount Vivian. *A. Victoriae* came in 2 miles north of The Twins and again between The Twins and Mount Eba.

(4) THE SAND RIDGES AND DRY SWAMPS.

The country between Chance's Swamp and Andamooka consists chiefly of parallel sand ridges running more or less east and west with flats between, with occasional dry swamps which form fresh water lakes after heavy rains. Of these Courlay Lagoon is the largest, more than a mile across with tableland on one side and sandhills on the other.

On the sand ridges, Sand Mulga, a spreading tall shrub, abounds in places, *Callitris* (*C. glauca*) in others, the latter often good straight timber trees. Bright green spreading shrubs of

Acacia ligulata are common. On a ridge of loose sand *Crotalaria dissitiflora* had been growing, but was now mostly dead forming upright twiggy skeletons.

In the flats between Myall and Mulga (*Acacia aneura*) were often abundant. Sometimes the Myall was chiefly present, sometimes the Mulga. Perennial *Atriplex* grew between these in places. Other shrubs or scattered trees were Bullock-bush (*Heterodendron*), Needle-bush (*Hakea leucoptera*), *Eremophila scoparia* (occasional), in one spot *E. Paisleyi*, the phyllodineous *Cassia* (*C. phyllodinea*), sometimes common, occasional *Templetonia egena*, one or two *Pittosporum phillyreoides*, and sometimes Dead-Finish (*Acacia teragonophylla*), *A. ligulata*, Hop-bush (*Dodonaea attenuata*) and Box-thorn (*Lycium australe*).

On Courlay Lagoon grew Samphire and round it Black Tea-tree (*Melaleuca pubescens*?). On the rocky descent from the tableland to its base, grew *Acacia Ossealdii*. On a small swamp grew Cane-grass (*Glyceria ramigera*).

II.—THE POSSIBILITY OF MAKING A BOTANICAL SURVEY WHILST TRAVELLING BY MOTOR CAR.

For many years the writer has kept records of the number of individuals of each species of bird seen during motor journeys in various parts of this and the other States. The results from time to time have been published. On the present occasion, he decided to attempt recording the botanical features visible from the motor car which travelled in general at from 20 to 30 miles an hour. The general appearance of the flora could alone be noted, together with the occurrence of trees and shrubs. Herbaceous plants, unless of striking appearance or when a stop was made, could rarely be recognised. With a fair general knowledge of the species that might be expected and by stopping to collect specimens for identification when necessary, it was found quite possible to make a highly accurate record. As the mileage was recorded when each note was made, the distribution of the various trees and shrubs could later be plotted on to a map. In this way, a record has now been obtained, not only of the trip north-west of Port Augusta, but also of the botanical features between Adelaide and Port Augusta. A copy of this has been filed by the Forestry Department and another copy has been handed to the Surveyor-General. In the course of time, if similar surveys are made in other parts of the State as opportunity offers, a wealth of information will gradually be collected.

regarding the distribution and extent of many of our trees and shrubs. As an illustration of the results obtained, the following may be taken:—

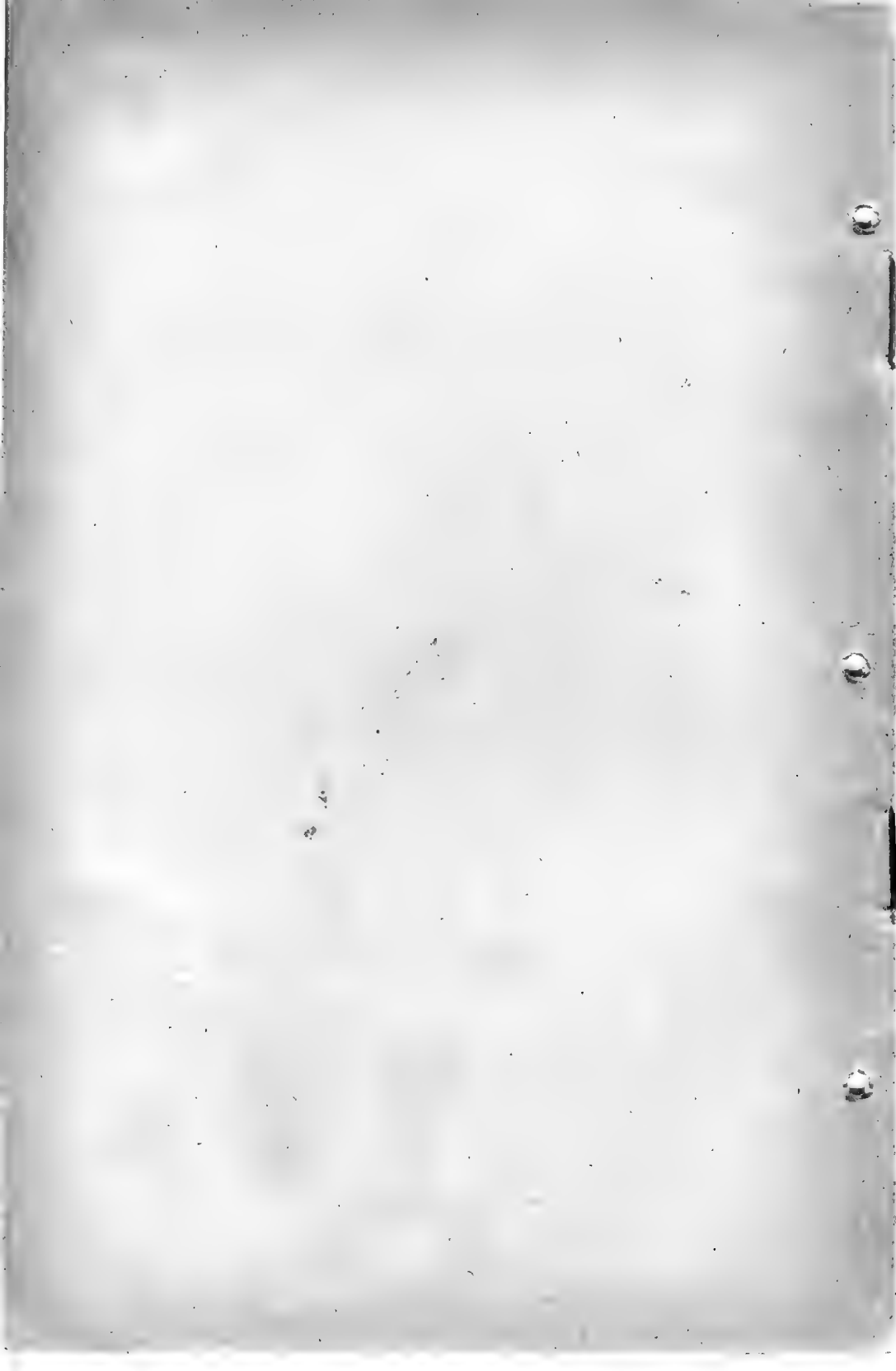
FRIDAY, 1ST NOVEMBER, 1929. Bore No. 10, 80 miles north of Tarcoola.

1 mile: Sandy, dead Mulga, burnt country.—2 miles: *Eremophila Paisleyi*, pinnate *Cassia*, *Eremophila Duttonii*, Mulga, *A. tetragonophylla* (Dead-Finish), *Eremophila rotundifolia*, Bluebush, *Atriplex*, *Trichinium*.—4 miles: Bluebush, *Hakea leucoptera*, pinnate *Dodonaea*, *Acacia* like *A. ligulata* (but tubular heads), *Pittosporum*.—5.6 miles: All open. *Casuarina lepidophloia* (Black-oak).—6 miles: Mulga. Burnt country.—10.7 miles: Quandang.—10.8 miles: Bore No. 5. Dry swamp *Chenopodium nitrariaceum* ("Swamp Cotton-bush"), *Morgania glabra*, *Grevillea*, *Melaleuca uncinata*.—16.8 miles: Mulga. Burnt.—17.2 miles: Very broad-leaved Mulga, *Grevillea* with *Loranthus*.—18 miles: Mulga. Burnt country, stumps of grass tussocks.—20 miles: Bore 1A. Granite outcrop. *Melaleuca uncinata* 10 feet high.—20.9 miles: Vermin Gate. *Parakeelya* in flower (native name "ingomar").—20.9-30 miles: Burnt country. Mulga. *Hakea leucoptera*, *Eremophila scoparii*, *E. Paisleyi*, *Cassia eremophila*, *Acacia Oswaldii*, occasional Bluebush, much dead Mulga.—30 miles: Mulga, very bare with butts of grass tussocks. 32.5 miles: *Scaevola spinescens*?—36 miles: McDouall Peak Station.

OUR EXCHANGES.

1. The Victorian Naturalist. November, December, and January numbers.
2. Journal of the Arnold Arboretum, Harvard University. October, 1930.
3. "Natural History." Journal of the American Museum of Natural History. November-December number.
4. "Notes on Gall-making Coccids," by Walter W. Froggatt, F.L.S.
5. "The Australian Museum Magazine." January number.

"Some Common Spiders," by A. Musgrave, should prove of interest to members.



The South Australian Naturalist

The Journal of the Field Naturalists' Section of the Royal
Society of South Australia and of the South Australian
Aquarium Society.

Adelaide

Vol. XII.



May, 1931

No. 3

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— o —

EXCURSIONS.

1931.

- June 8—Train at 9.23 a.m. to Hallett's Cove. Geology. Mr. W. Ham
June 27—Train at 1.35 p.m. to Lefevre's Peninsula. Botany. Mr. E. H. Ising.
July 18—Entrance to Museum at 2.30 p.m. General. Mr. H. M. Hale.
Aug. 1—Tram at 1.30 p.m. Henley to Glenelg. Shells. Mr. F. K. Godfrey.
Aug. 15—Train at 1.43 p.m. to Kingston Park, Marino. Botany. Mr. J. A. Hogan.
Sept. 5—Entrance to Botanic Gardens at 2 p.m. Australian Flora. Mr. J. F. Bailey.
Sept. 19—Train at 1.15 p.m. to Mr. E. Ashby's, Blackwood. Cultivated Native Flora. Mr. E. Ashby.

— o —

LECTURES.

- June 16—"Palestine." By Lt.-Col. D. Fulton, C.M.G., C.B.E.
July 21—"Africa." Cinematograph Film. By Mr. Keith Minchin.
Aug. 18—Annual Meeting.
Sept. 19—"An Aerial View of Central Australia." By Professor C. T. Madigan, M.A., B.Sc.

The South Australian Naturalist.

Vol. XII.

ADELAIDE, MAY, 1931.

No. 3.

CUTTLEBONES FROM ROBE WITH DESCRIPTION OF A NEW SPECIES.

by BERNARD C. COTTON. *South Australian Museum.*

Although most of our common species of Mollusca are known to Conchologists, very few are aware that at least six species of cuttlebones occur on our open beaches. The chalky thickening of the "bone" is used in the manufacture of dentifrice, for taking impressions of objects, and as a beak sharpener for caged birds. It will surprise most people to know that crushed cuttlebone has proved highly satisfactory for packing fruit.

During a recent visit to Robe, a special effort was made to obtain a comprehensive collection of these "shells" of the cuttlefish. Six species representing five genera were obtained. Of these, *Decorisepia jaenschi* is new to science. The only specimen of *Glyptosepia hedleyi* Berry hitherto taken in South Australia, is a fragmentary one in the collection of Stillman Berry of California. *Mesembrisepia chirotrema* Berry is very rare, Mr. Kimber having supplied the only two specimens in the museum collection taken in South Australia.

The terms used in describing a cuttlebone, or sepiion as it is scientifically called, are explained in the accompanying diagram, Figure 1.

The five genera found in South Australia may be distinguished by the following key.

- a. Spine not ventrally keeled.
 - b. Inner cone well developed.
 - c. Inner cone produced as a glaze, spine eroded away in the adult *Amplisepia.*
 - cc. Inner cone not produced as a glaze, but sharply defined, spine not eroded in the adult
... .. *Mesembrisepia.*
 - bb. Inner cone obsolete.
 - d. Sepion over five times as long as wide ...
... .. *Arctosepia.*
 - dd. Sepion less than three times as long as wide
... .. *Decorisepia.*
- aa. Spine ventrally keeled *Glyptosepia.*

Amplisepia apama. GRAY. Figure 2.

Sepion large, elongate oval; spine eroded away in the adult, small and delicate in the juvenile; dorsum pustulose, cream coloured; venter swollen orally; striae close, ventral sulcus shallow; outer cone thick, calcareous; inner cone not sharply defined, appearing as an elongate glaze.

Type. Port Adelaide.

Specimen illustrated. 280 x 100 mm.

The largest and most common South Australian Species.

Mesembrisepia. Iredale.

Two species of this genus occur and may be distinguished by the following key.

a. Dorsal surface weakly pustulose, dorsal rib weakly defined; ventral sulcus shallow *novaehollandiae*.

aa. Dorsal surface coarsely pustulose, dorsal rib defined by two deep lateral furrows; ventral sulcus deep *chiotrema*.

Mesembrisepia novaehollandiae. HOYLE. Figure 3.

Sepion of medium size, elongate oval; spine strong, rounded, dorsally oblique, mounted on a callous ridge; dorsum pink, pustulose; venter swollen orally, striae close, wavy, ventral sulcus shallow; outer cone calcareous; inner cone well developed; sharply defined.

Type. Kangaroo Island.

Specimen illustrated. 140 x 50 mm.

Very variable. A wide form obtained at Robe is probably the sepion of the female, which is wider across the outer cone and more excavate ventrally.

Mesembrisepia chiotrema. BERRY. Figure 4.

Sepion larger than in the preceeding species; elongate oval, spine very strong, dorsally oblique, mounted on a callous ridge; dorsum cream, coarsely pustulose all over, central rib defined by two lateral furrows; venter swollen orally, striae close, wavy, ventral sulcus deep; outer cone thickly calcareous; inner cone well developed, sharply defined.

Type. Kangaroo Island.

Specimen illustrated. 160 x 42 mm.

Probably the deep water representative of *M. novaehollandia*. Four specimens were taken.

Arctosepia braggi. VERCO. Figure 9.

Seption small, narrow, elongate, spine long, rounded; dorsum pink, smooth, central rib indistinct; venter swollen orally, striae close, regular, sulcus a mere linear depression; outer cone narrow, chitinous; inner cone obsolete.

Type. Gulf St. Vincent.

Specimen illustrated. 70 x 11 m.m.

The smallest of our species. Fairly common.

Decorisepia jaenschi. sp. n. Figures 5 and 6.

Seption of medium size, elongate oval, pointed orally; spine strong, round; dorsum pink, finely pustulose, though apparently smooth to the naked eye, central rib narrow, defined by two lateral furrows; venter, slightly swollen orally, striae close, no ventral sulcus; outer cone thin but little calcified; inner cone obsolete.

Type. Robe.

Specimen illustrated. (Type) 103.5mm. long, 37 mm. wide, 8.7 mm. thick.

South Australian Museum. D.10163.

The author first found this species at Port Fairy, Victoria, noting in M.S.S. that it was apparently a novelty. Interest was revived by the discovery of a dozen specimens at Robe. Named after Mr. F. Jaensch, my companion of the trip.

Glyptosepia hedleyi. BERRY. Figures 7 and 8.

Seption of medium size, elongate oval, pointed and laterally concave orally; spine long, ventrally keeled; dorsum cream, very finely pustulose, apparently smooth to the naked eye, central rib indistinct; venter slightly swollen orally, striae close, regular, no sulcus; outer cone thin, narrow; inner cone obsolete. Figure 7 gives an enlarged lateral view of the spine.

Type. South of Kangaroo Island.

Specimen illustrated. 44 x 15 mm.

A dozen specimens were obtained.

SHELL COLLECTORS CLUB.

Interest is well maintained. The members have been very pleased to learn of the improvement in health of the Chairman, Mr. W. J. Kimber, and look forward to his presence again at the meetings.

Acknowledgment is here made, with great appreciation, of the kind assistance rendered by Mr. T. Iredale, of the Australian Museum, Sydney, in identifying shells and revising portions of our list.

Thanks are also due to Mr. B. C. Cotton, of the South Australian Museum for his valuable aid in the identification of specimens.

In the following notes of shells reviewed at the meetings during the quarter, economy of space has been considered, and it is suggested that the description of the species be read together with the remarks on the genus and family.

The numbers on the extreme right refer to Sir J. C. Verco's Catalogue of Marine Mollusca of South Australia, 1908.

Miss J. M. Murray has again ably illustrated the shells.

Family *GALERIDÆ*=*Calyptraeidae*.

A cosmopolitan group with patelliform or dish-shaped shells, whose summits are more or less spiral, the interior polished and porcellaneous, and chambered by a basal plate, variously shaped. They adhere to stones or other shells and appear never to quit the spot on which they first settle, as the margins of the shells become adapted to the irregularities of the surface beneath. Form and colour depend upon the situation. Those inside dead shells are generally flat or concave above and colourless; those on the outside of shells are convex and coloured. The animals sometimes hatch their spawn under the forepart of the foot. The beach student will obtain *Sigapatella calyptraeformis* Lamarck and the Slipper Limpet, *Zeacrypta immersa* Angas without much difficulty, attached to *Pinnæ* and other shells which are cast up during rough weather. *Zegalerus hedleyi* Smith is much more uncommon under similar conditions.

Genus *SIGAPATELLA* Lesson, 1830.

S. Calyptraeformis Lamarck, 1822. Fig. 1. 306.

Shell thin, patelliform, roundly oval, spiral, with a purplish lateral apex well behind the centre; growth lines well marked; colour greenish yellow to light brown; periostracum thick, horny, ragged; whorls 3-4, the last very large; interior white tinged with

purple, shining; basal plate or septum reaching round nearly half the circumference, with fine distinct growth lines, the free margin thin, sharp. Height, $\frac{1}{4}$ inch (variable proportionately). Diameter, $\frac{3}{4}$ inch. Attached to stones and shells beyond low water mark. All round the coast. Fairly common. Cast up during rough weather.

Genus ZEGALERUS Finlay, 1926.

Z. hedleyi Smith, 1915. Fig. 2. 307.

= *Calyptrea scutum* Lesson, 1830.

not *Z. tenuis* Gray (*Sigapatella*) which is Neozelanic.

Shell thin and fragile, depressed conoidal, spiral; colour very light brown; apex subcentral, reddish, elevated, knob-like, of about two smooth, shining whorls which are deeply sutured; periostracum very thin, horny; whorls about 4, flatly convex; suture inconspicuous; aperture rounded; margin thin and sharp; basal plate smooth, shining, with growth lines, coiled loosely so as to leave a free space in the centre, showing the apex. Height, $\frac{1}{4}$ inch (variable) Diameter $\frac{1}{2}$ inch. Not common. Attached to dead shells cast up during storms.

Genus ZEACRYPTA Finlay, 1926.

Z. immersa Angas, 1865. Fig. 3. 305.

= *Crepidula immersa* Angas.

The vernacular "Slipper Limpet" is well chosen. Shell oval, patelliform, often twisted, conforming to the surface to which it is attached; usually thin, but apparently thickens considerably with age; apex purplish, lateral, spiral, near the hinder margin; growth lines distinct; colour light brown to yellowish; interior shining, porcellaneous, of various shades of brown, with a septum or basal plate, posteriorly situated, milky white, with delicate growth lines. Greatest length, 1 inch; breadth, $\frac{3}{4}$ inch. Fairly common. Attached to dead shells which are cast up by heavy seas.

Family CAPULIDAE.

The "Bonnet Limpets" have an ancient lineage, dating from the Silurian. As with groups just considered, these molluscs remain through life on the shells or other marine substances on which they first settle, and when taken from a scallop the margin is wavy like the ribs of the bivalve. Unlike *Hipponix*, there is no

shelly base of attachment secreted by the animal. The recurved, posteriorly placed apex, inclined slightly to one side gives the shell a bonnet-like appearance. *Capulus australis* Lamarck is well within the reach of the beach student. *C. violaceus* Angas is very common in places.

Genus CAPULUS Montfort, 1810.

Shell somewhat conical, rather thin; apex posterior, more or less spirally curved and directed to one side; growth lines distinct parallel with the margin. *Capulus* is more compressed at the sides than *Hipponix*.

C. australis Lamarck, 1819. Fig. 4. 302.

not *C. danieli* Crosse, which is a New Caledonian species.

Our largest species, about the same size as *Hipponix conicus* Schumacher, but distinguished by its thinner shell, inclined recurved apex, more compressed sides and the absence of radial sculpture. Shell somewhat rugged with distinct growth lines near the margin; colour reddish; interior white, porcellaneous, with large reddish muscle scar. Height, $\frac{1}{2}$ inch; back to front, 1 inch; all dimensions are variable. Fairly common. Attached to scallops and other shells.

C. devotus Hedley, 1904.

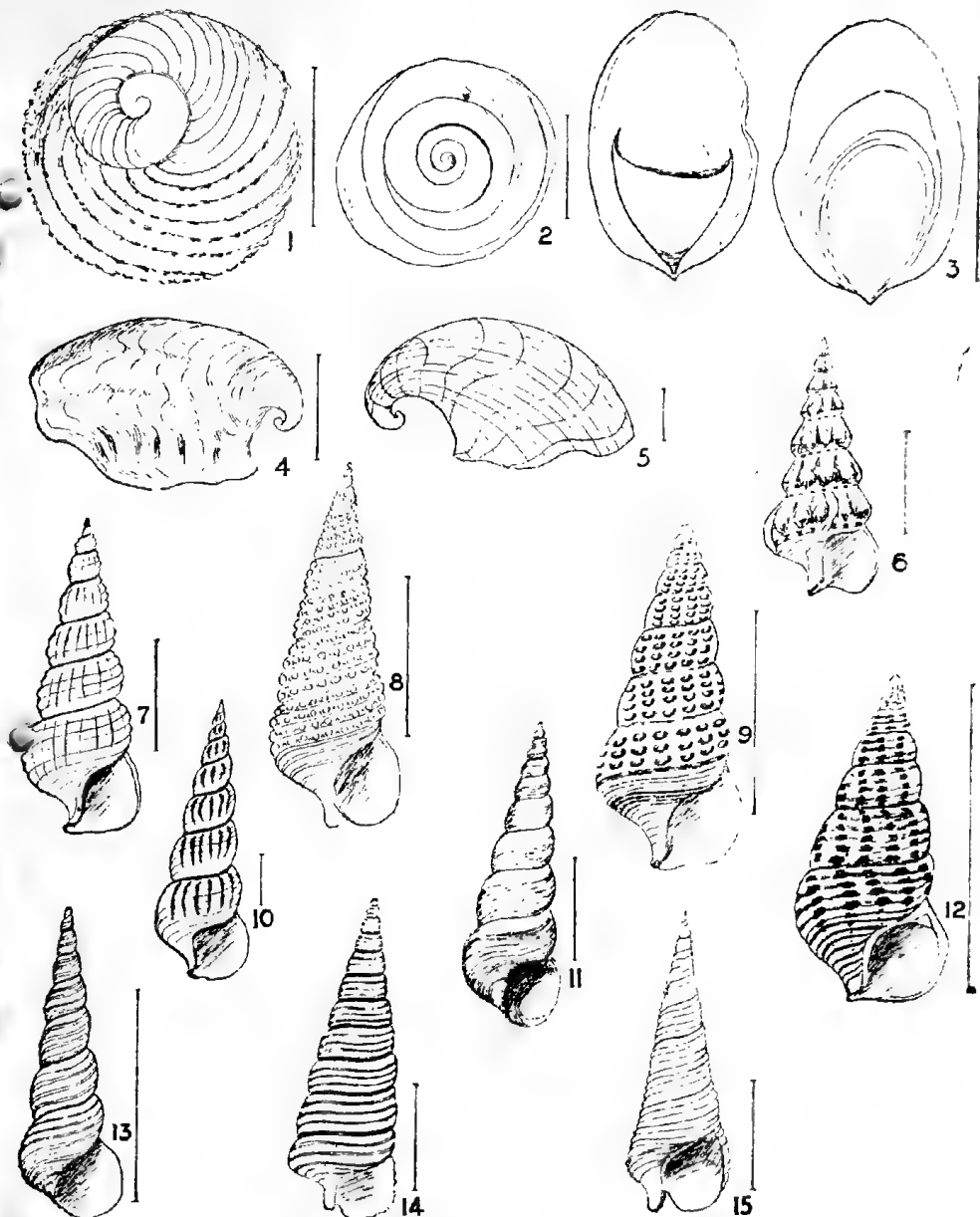
Small, elevated, irregular, white; no periostracum; delicate, regular, concentric hair lines; apex projecting far beyond the base; aperture subcircular. The lack of colour and rounded form distinguish it from *C. violaceus* Angas. Height, one-eighth of an inch; back to front, slightly more. Not common.

C. violaceus Angas, 1867. Fig 5.

Shell elevated, laterally compressed, recurved, oblong-oval at the base, radiately lined, apex inclined to the right; internally with a very narrow rib, rounded at the edge, situated in the cavity of the shell and extending on either side nearly to the middle of the aperture; interior violet. Height, $\frac{1}{4}$ inch; back to front, $\frac{1}{2}$ inch. Adheres to stones at low water. Common, St. Kilda (Gulf St. Vincent).

Family CERITHIIDAE.

Cerithium signifies a small horn. The species are especially variable in the anterior (lower) canal which is always rather short, but sometimes disappears altogether. These molluscs live on or under rocks, or among marine plants, mostly in shallow coastal waters, or under estuarine conditions. The beach student will find this a most interesting group, with some species cast up



1. *Sigapatella calyptraeformis* Lam.

2. *Zegalerus hedleyi* Smith.

3. *Zeacrypta immersa* Angas.

4. *Capulus australis* Lam.

5. *Capulus violaceus* Angas.

6. *Plesiostrochus monachus* Cr. & F.

7. *Ataxocerithium serotinum* A. Adams.

8. *Cacozeliana granarium* Kiener.

9. *Cacozeliana cerithium* Q. & G.

10. *Cacozeliana icarus* Bayle.

11. *Cacozeliana lawleyanum* Crosse.

12. *Zeacumantus diemenensis* Q. & G.

13. *Zeacumantus estuarinum* Tate.

14. *Scila crocea* Angas.

15. *Notosela allosutura* Ten-Woods.

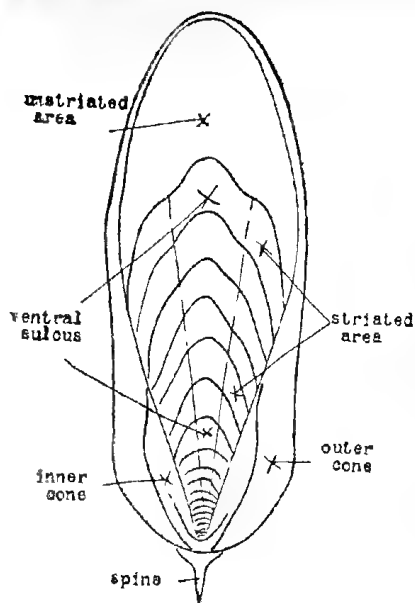


FIG 1

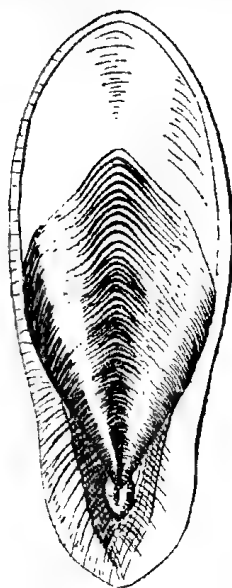


FIG 2

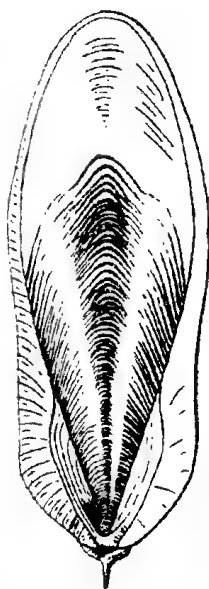


FIG 3

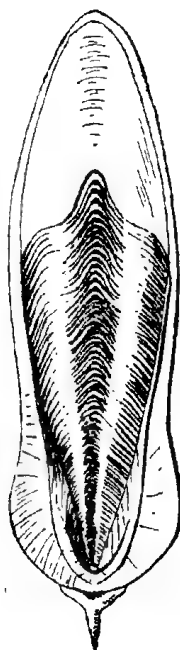


FIG 4

BC

- Fig. 1. Diagram explaining terms used in describing a cuttlebone
 Fig. 2. *Amplisepia apama* Gray.
 Fig. 3. *Mesembrisepia novaehollandiae* Hoyle.
 Fig. 4. *Mesembrisepia chirotrema* Berry.

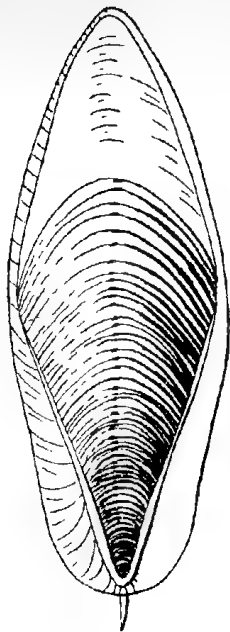


Fig 5.

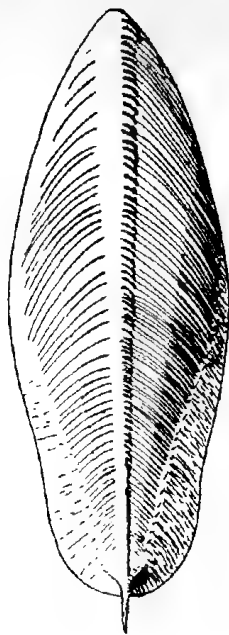


Fig 6.

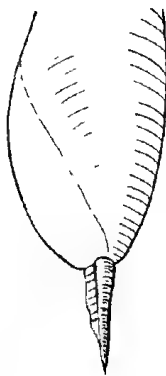


Fig 7



(BC)

Fig 9

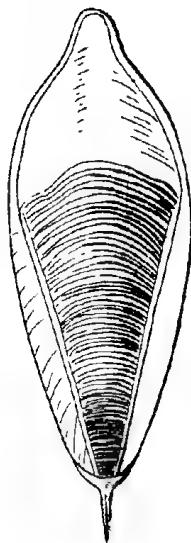


Fig 8.

Fig. 5 & 6. *Decorisepia jaenschi* sp.n.

Fig. 7 & 8. *Glyptosepia hedleyi* Berry.

Fig. 9. *Arctosepia braggi* Verco.

in all weathers. The most common on our beaches are *Cacozeliana granarium* Kiener, *C. cerithium* Q. & G., *C. lawleyanum* Crosse, also, common in shell sand. *Plesiotrochus monachus* Cr. & F., and *Cacozeliana icarus* Bayle.

Genus PLESIOTROCHUS Fischer, 1878.

This is a tropical genus, and whereas our species which is referred to it, appears confined to the Adelaidean or Flindersian faunal region, outside the tropics, Iredale anticipates its early transference.

P. monachus Cr. & Fischer, 1864. Fig. 6. 390.

Shell pyramidal, fairly solid, brownish, with a line of red spots winding round the sutures; whorls about 9, pagoda-like, with several faint spiral grooves, and varices angulated at the middle of each whorl; base grooved; mouth oval, angulated at the outer lip; canal short. In life, the varices have a fringe of hairs. Height, $\frac{1}{2}$ inch; diameter, $\frac{1}{4}$ inch. Common in shell sand, Gulf St. Vincent.

Genus ATAXOCERITHIUM Tate, 1893.

A. serotinum A. Adams, 1855. Fig. 7. 391.

Shell elongate, turreted, pale brown, some specimens white; about 10 whorls, somewhat swollen medially, with longitudinal ribs crossed by spiral striations; large whorl contracted on one side; mouth subcircular; canal short, partly closed over. Height, $\frac{1}{2}$ inch; diameter, about one-third as great. Not common, Port Willunga and farther south.

Genus CACOZELIANA. Iredale.

Species of this genus were formerly referred to *Bittium* Gray. Shell tall, with slightly convex, granular whorls; longitudinal riblets crossed and cut up into numerous beads by spiral sculpture, usually about 4 rows of beads on a whorl; base slightly concave, with a few spiral riblets; varices not always distinct; mouth oblique, oval, with a short, broad, open, anterior canal; columella short, arched; operculum horny, few-spiral.

C. granarium Kiener, 1842. Fig. 8. 382.

A reddish-brown shell, solid, somewhat cylindrical, spirally girt with granular or beaded reddish ribs and a rather sharp pointed apex. Height, $\frac{3}{4}$ inch; diameter, about one-fourth as great. All round the coast. Very common on shell sand patches.

C. cerithium Q. & G.

Fig. 9.

= *Bittium turritella* Quoy.

Shell larger, heavier and broader proportionately than *C. granarium* Kiener, with broad and rounded axial ribs and somewhat coarse granules, 4 rows on a whorl; colour reddish-brown (bluish-black in life). Height, 1 inch; diameter, one-third as great. Very common, all round the coast. Plentiful in life, on mud flats at half-tide, Outer Harbour.

C. icarus Bayle, 1880.

Fig. 10.

389.

= *Cerithium tenue* Sowerby, 1855. (Preoccupied).

Tall and turreted, whorls 9, with 4 spiral rows of numerous small beads or grains; back of last whorl with a prominent varix; colour may be white (with brown spot on body whorl), reddish-brown or chocolate and variegated with blue, black and brown. Height, $\frac{1}{4}$ inch, which is 4 times greater than the diameter. A beautiful tiny shell, quite common in shell sand from most beaches.

C. laxleyanum Crosse, 1863.

Fig. 11.

383.

= *Bittium laxleyanum* Crosse.

This species is referred tentatively to *Cacozeliana*. Shell fairly tall, tapering, whorls about 11, slight convex, spirally grooved, about 8 grooves on the penultimate whorl, sometimes with broad axial ribs, and some specimens show low varices. Colour bluish, white banded. Mouth oblique, oval, slightly notched and effuse below, but no distinct canal. Height, $\frac{1}{2}$ inch; diameter, about one-fourth as great. Very common in shell sand. The absence of granulations on the whorls, and the bluish-black appearance with whitish bands below the sutures, serve to distinguish it.

Genus ZEACUMANTUS Finlay, 1926.

= *Pyrazus* Montfort, 1810.

Shell tall, tapering, whorls numerous, slightly convex, with somewhat oblique, longitudinal ribs, sometimes coarsely granular; base slightly concave; mouth oblique, oval, channelled above, with a very short, oblique, canal at base.

Z. diemenensis Q. & G., 1835.

Fig. 12.

393.

= *Pyrazus diemenensis* Q. & G.

Shell like a big *Cacozeliana cerithium* Q. & G. Somewhat heavy in appearance, blackish (reddish-brown when beach rolled), ribbed irregularly and spirally grooved, whorls rounded beneath. Height, $1\frac{1}{2}$ inches; diameter, about two-fifths as great. Not common, on sands, southern Yorke's Peninsula, and farther west.

Z. estuarinum Tate, 1893. Fig. 13. 384.
= *Bittium estuarinum* Tate.

Tall and narrow, apex acute, whorls about 12, convex, covered with a bluish-black to grey periostracum, beneath which the colour is reddish; suture distinct; base convex; mouth circular, slightly angulated and effuse at the base of the columella; shining black within; ornament consists of slightly arched axial ribs which disappear on the area just above the suture, and faint spiral threads (about 12 and about 6 respectively on the penultimate whorl), without distinctive granulation throughout. Height 1 inch, diameter barely $\frac{1}{4}$ inch. On mud between tide marks, Port River, and Franklin Harbour; on *Zosteræ*, Lake Macdonald (West Coast of South Australia). Not common.

Genus JOCULATOR Hedley.

J. cesticus Hedley, 1906. 400.
= *Cerithiopsis minimum* Ten-Woods, 1877.

Tenison-Woods, in describing this shell, remarked that in colour and ornament it is like *Cacozeliana granarium* Kiener, but more tumid, and completely distinguished by its very minute size. Height, one-tenth of an inch, which is two and a half times greater than the diameter. Not common, in shell sand.

Genus ZACLYS Finlay, 1926.

Z. dannerigi Hedley, 1911.

Tall, slender, translucent, pale buff, the beaded rows opaque white, with about 15 whorls. Height, $\frac{1}{4}$ inch, which is more than five times greater than the diameter. A deep water species.

Genus CERITHIOPSIS Forbes & Hanley, 1853.

The following species is only provisionally referred to this genus (which is not austral), pending a decision as to its true location.

C. geniculosus Hedley, 1911.

Tall, regularly tapering, much constricted between whorls, glossy, uniformly snow white, whorls 13, radiately ribbed. Height one-third of an inch, which is 4 to 5 times greater than the diameter. A deep water species.

Genus DONOVANIA Bucq, 1882.

D. fenestrata Tate & May, 1900.

Rather stout, somewhat spindle-shape, tapering, pale fawn, with a papillary protoconch of 3 inflated convex whorls, and $5\frac{1}{2}$ spire whorls, moderately convex, with deep sutures, ornamented

with 5 spiral and 20 axial ridges of equal strength which produce square, deep fenestrations; colour, light brown, glistening white, or translucent. Height, $\frac{1}{2}$ inch, which is more than four times the diameter. Not common.

Genus SEILA Adams, 1861.

S. crocea Angas, 1871. Fig. 14. 396.

Tall, sharply pointed, rather thin, orange coloured throughout, whorls 14, encircled by 4 rounded, smooth, close set ribs, nearly equal in size; last whorl flattened and smooth at the base; apical whorl sinistral; mouth squarish. Height, $\frac{1}{2}$ inch, which is four times greater than the diameter. Not very common. Port Willunga and farther south. A most attractive shell.

Genus NOTOSEILA Finlay, 1926.

N. albosutura Ten-Woods, 1876. Fig. 15. 397.
= *Seila albostura* Ten-Woods.

This species differs from *Seila crocea* Angas in being more cylindrical, with a narrow base, in its style of colouring, and in having the lateral outline less rectilinear. The special peculiarity is the white suture, which is more like a white cottony incrustation than a colouring of the substance of the shell, and this appearance occurs at intervals in the interstices between the smooth rounded ribs. Height, $\frac{1}{2}$ inch, or fully four times greater than the diameter. Fairly common and generally distributed.

Genus SEILAREX Iredale, 1924.

S. turritelliformis Angas, 1877. 401.
= *Seila attenuata* Hedley, 1900.

Very tall and slender, gently tapering; colour, from deep chocolate to pale ochre, the upper portion always darker than the remainder; whorls 13, convex, contracted at the sutures; 4 spiral sharp cords ascend the whorls, crossed by irregular growth lines. Height, one-third of an inch, which is four and a half times greater than the diameter. Uncommon. Yorke Peninsula and head of Spencer Gulf.

Genus MESALIA Gray.

M. melanoides Reeve, 1849.

Rather long, pointed, turreted; about 12 convex whorls, spirally lined, with slight varices on the smaller whorls; mouth rounded, with a slight anterior canal; inner lip twisted and flattened. Height, $1\frac{1}{2}$ inches, being three times greater than the diameter. Uncommon.

OUR EXCHANGES.

1. "The Victorian Naturalist." March number.
There is an interesting article on "The Tallest Australian Tree," by A. D. Hardy. The author measured a mountain ash (*E. regnans*) nine miles from Marysville which stood 303 ft. in height. The record tree of W.A. is said to be a Karri (*E. diversicolor*, 278 ft. in height.
2. "The Programme of Activities of the Chicago Academy of Sciences for 1931." An ideal programme.
3. "W.A. Naturalists' Club Programme for January, February, March and April."
4. "Journal of the American Museum of Natural History for March and April, 1931." Among many excellently illustrated articles of outstanding interest, "The Fate of the Rash Platybeledon" should appeal to many of our members. "How Old is the Earth?" and "The Great Kalahari Sand Veldt" will also prove attractive.
5. "The Australian Forestry Journal for March."
It is indicative of the times that with this Number, the Journal suspends publication. Absit Omen!
6. "The Australian Museum Magazine for April—June, 1931."
An interesting number. Among the articles treated are Diatoms, Asbestos, Barnacles, and Mineral Collecting in Central Australia.
7. "Linnean Society of N.S.W. Abstract of Proceedings, April, 1931."
8. "Report of Victorian Field Naturalists' Expedition through the Western Districts of Victoria in October, 1827."
9. "Papers and proceedings of the Royal Society of Tasmania for the year 1930."
10. "Journal of the Arnold Arboretum, Harvard University."

ADDITIONS TO OUR LIBRARY.

1. "A Philosopher with Nature," by Benjamin Kidd.
The well-known author of "Social Evolution" was a keen observer of nature, and this collection of nature studies shows a sharp observation allied with reflections of a philosophical character admirably expressed. "The Instinct of Animals," "What do Young Animals Know," "Wild Bees," such are the subjects delightfully handled by this noted writer.
2. "Sunset Trails," by Archer Russell, F.R.A.I.
Mr. Russell is known to many of our readers from these articles, many of which have appeared in the "Saturday Journal." All will be delighted with the first-hand observation, and the breezy style of the writer who deals pleasantly with the native life of our back country. Mr. Russell is a nature student who loves Nature in all her phases, and writes with discernment and charm. Will Ashton adds a foreword to this attractive little book which should find its way to the shelves of every member. Our copy, from Cole's Book Arcade, costs but two shillings.

BOTANICAL NOTES, No. 8.

by ERNEST H. ISING.

Acacia rhigiophylla. F. v. M. The rediscovery of this plant was recorded in an earlier number of this journal (Vol. VII, No. 1, 1925) as having been found by Prof. J. B. Cleland at Kinchina in 1924. On looking through some specimens, I noted that I had collected the plant myself on 15-9-17 at Monarto South making my record 7 years earlier than that of Prof. Cleland.

DOUBLE FLOWERS. In 1885, the Rev. W. Woolls recorded in the journal of the Linnean Society, New South Wales, Vol. 10, page 455, the following species of native plants bearing double flowers as occurring in that State:—*Rubus rosifolius*, *Epacris purpurascens*, *E. microphylla*, *E. impressa* (collected by Mr. C. French in Victoria), *Sprengelia incarnata*, *Astroloma humifusum*, *Ranunculus lappaceus* (the common buttercup), and var. *pimpinellifolius*, *Eriostemon obovalis*, *Convolvulus erubescens* (common on the Adelaide Plains and elsewhere), and *Wahlenbergia gracilis* (the harebell that is so well-known and so widely distributed in this State). Most of the above species grow in our State but so far I only know of one species (*Epacris impressa*), the favourite heath, which has been found in South Australia with double flowers. Mr. A. J. Morison was the first to discover this rarity and he found it growing at Mt. Lofty in October, 1930. He only saw one plant and the flowers were of a dark red colour; fortunately he kept the specimen and I now have it in my possession.

Melaleuca decussata, R.Br.

On page 45 of Vol. X, No. 3, 1929, of this journal, I recorded the species *M. gibbosa* as growing at Longwood in a swampy depression in association with *Eucalyptus cosmophylla*. On revisiting this particular spot recently I now find that I made a wrong identification and the species is *M. decussata*; it was collected in flower, the colour being a pale mauve, from shrubs which were at least 10 feet in height.

The South Australian Naturalist

The Journal of the Field Naturalists' Section of the Royal Society of South Australia and of the South Australian Aquarium Society.



Adelaide



Aug. 1931

Vol. XII.

No. 4

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The authors of papers are responsible for the facts recorded and opinions expressed.

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EXCURSIONS.

1931.

- Aug. 29.—Aldgate to Mt. Lofty and Sunset Point. Train at 1.15 to Aldgate. Walk Mt. Lofty. General. Mr. A. J. Morison.
Sept. 19.—Blackwood (Mr. Ashby's). Train 1.15. Cultivated Native Flora. Mr. E. Ashby.
Oct. 3.—National Park. Train 1.15. Orchids. Dr. R. S. Rogers.
Oct. 14.—Mylor. Conveyance to be arranged. Botany. Mr. A. J. Morison.
Oct. 16 & 17.—Flower Show. Town Hall.
Oct. 31.—Blackwood Flower Show. Train 1.15.
Nov. 14.—Morialta. Tram 1.30. Botany. Prof. J. B. Cleland.

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LECTURES.

- Sept. 15.—"An Aerial View of Central Australia." By Prof. C. T. Madigan, M.A., B. Sc. Illustrated with lantern views.
Oct. 20.—"Fleurieu Peninsula, the Unknown." By M. L. Reynolds.
Nov. 17.—"Animal Parasites and Messmates." By Mr. H. M. Hale, Director of the S.A. Museum. Illustrated with lantern slides.

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No. 4.

SOUTH AUSTRALIAN SHELLS.

PART I.

by BERNARD C. COTTON and F. K. GODFREY.

This article deals with a few families of South Australian shells. A short, specific description in simple language is given and at least one species in each genus illustrated. The authors hope, gradually, to describe other families in this simple way.

TRIPHORIDAE.

Shell elongate, sinistral, rarely dextral, sculptured with spiral keels, either plain, tuberculate, or gemmate; mouth small with a more or less recurved canal which is often tubular; outer lip notched near the suture, sometimes forming an isolated tube; operculum horny, with few spirals. Distribution, Indian Ocean, West Indies, Europe and Australasia. The South Australian species hitherto placed in *Triphora* are not congeneric and may be arranged in six different genera based upon the type of protoconch. Several species may be found in beach shell sand but some only inhabit deep water. Fossil Tertiary.

EUTRIPHORA gen. nov. Protoconch blunt, whorls rounded, first three axially plicate without spiral keels or grooves; nodular sculpture, like that seen on the spire whorls, commences on the fourth whorl of the protoconch. Type *Triphora cana* Verco.

E. CANA Verco 1909. (*Triphora*) Pl. 1. figs. 1 & 2. Tapering; apical whorls usually white, the rest light brown; first whorl with one gemmate keel, the second with two, the third with three, the last arising between the other two; sometimes the uppermost pearl row is slightly larger than the others; base flatly convex; outer lip slightly cut back towards the suture. Height 8 mm.; diam. 2.1 mm. Not common. Beachport to St. Francis Island, 35 to 110 fathoms.

E. DEXIA Verco 1909 (*Triphora*). Dextral, smaller whorls tapering, larger whorls cylindrical; white; in the larger whorls are three round, rather rugged, spiral ribs; oblique axial riblets extend between the sutures, about 16 in the penultimate whorl; spire whorls 12, not convex; body-whorl has three openings, a bent tube formed by the closure of the anterior channel, one similar at the posterior canal and projecting just below the suture; mouth complete, round, produced into a wide tube and effuse. Height 7.5 mm.; diam. 1.6 mm. Not common. Beachport to Cape Borda. 40 to 110 fathoms.

E. EPALLAXA Verco 1909 (*Triphora*). Dextral; resembles *E. dexia* in general shape and in having three well formed apertural tubes, but is distinguished by the two rows of tubercles of which the lower row is the larger. Height 7.9 mm.; diam. 1.7 mm. Uncommon. Cape Jaffa 130 fathoms.

ISOTRIPHORA gen. nov. Protoconch blunt with nodular sculpture retained to the apex. The rest of the shell beset with rows of gemmules. Type—*Triphora tasmanica* Ten. Woods, 1876.

I. TASMANICA Ten-Woods 1876 (*Triphora*). Pl.1, figs. 3 and 4. Elongate, tapering; reddish-brown, dull; three equal gemmule rows on the larger whorls, with a brown dot between the gemmules of the lowest tier; whorls about 13, flat. Height 9; diam. 3 mm. Not uncommon. Beachport to Cape Borda, 40 to 55 fathoms.

I. LILACINA Verco 1909 (*Triphora*). Elongate, tapering; delicate lilac tint on the apex and a spiral of lilac gemmules above the suture, occasionally the lilac is replaced by white; three equal gemmule whorls on the larger whorls. Height 4 mm.; diam. 1.4 mm. Not uncommon. Beach, Gulf St. Vincent. West Coast, St. Francis Island. Dredged Beachport to St. Francis Island down to 55 fathoms.

I. NIVEA Verco 1909 (*Triphora*). Elongate, tapering; pure white; three gemmule rows on the larger whorls. Height 6 mm.; diam. 1.5 mm. Not uncommon. Beach Gulf St. Vincent. Dredged Beachport to St. Francis Island down to 110 fathoms.

I. AUREOCINCTA Verco 1910 (*Triphora*). Elongate, tapering; dark purple with a golden band in the suture and on the base. Height 4 mm.; diam. 1 mm. Uncommon. Cape Borda, 55 fathoms.

I. DISJUNCTA Verco 1909 (*Triphora*). Elongate, tapering; light-brown; three rows of beads equal in size; sutural spaces rather wide. Height 7.5 mm.; diam. 2 mm. Uncommon. Beachport to Cape Borda, 55 to 300 fathoms.

NOTOSINISTER Finlay 1926. Protoconch, whorls with a sharp median keel crossed by narrow axial threads. Type—*Triphora fascelina* Suter 1908. (New Zealand).

N. GRANIFERA Brazier 1894 (*Triphora*). Pl. 1, figs. 5 & 6. Short, thick, with straight sides; glistening translucent white, with brown squarish blotches (few or many): three spirals of closely packed beads of equal size on the larger whorls, two plain spiral keels on base; suture deep. Height 4.45 mm.; diam. 1.5 mm. Common. Beach from MacDonnell Bay to Scales Bay. Dredged Beachport to St. Francis Island down to 150 fathoms. Sometimes the lowest pearl row is the largest, and the highest, the smallest. Sydney shells are mostly dark, or light-brown.

N. INNOTABILIS Hedley 1902 (*Triphora*). Pl. 1, fig 15. Slender, narrow; brown, gemmules dull white; larger whorls with three gemmule rows, the median much the smaller; gemmules large, prominent; base with two plain spiral keels. Height 4.5mm; diam. 1.3 mm. Common. Beach Gulf St. Vincent and Streaky Bay.

N. MAMMILLATA Verco 1909 (*Triphora*). Shape varies, short, broad and pupaeform or long and narrow; yellowish-white, the lowest row of pearls white, beneath them a narrow line of ochre, base and protoconch ochreous; three gemmule rows on the larger whorls and four rows above the base, the lowest row usually the largest. Height 5.5 mm.; diam. 1.5 mm. Not uncommon. Beach, MacDonnell Bay to Venus Bay.

N. LATILIRATA Verco 1909 (*Triphora*). Elongate, sides straight; white; three spirals, flat, wide, nearly smooth; whorls flat, sloping; base convex with a peripheral spiral, rounded, smooth keel and a second one below, punctuated between; outer lip slightly cut back at the suture; basal canal nearly closed, recurved. Height 10.5 mm.; diam. 2.5 mm. Uncommon. Gulf St. Vincent. Dredged, Gulf St. Vincent to St. Francis Island down to 55 fathoms.

N. ARMILLATA Verco 1909 (*Triphora*). Elongate, tapering; white, but for the fifth and sixth whorls which are dark-brown, protoconch light-brown; larger whorls with three rows of gemmules of equal size, gemmules large; base flatly convex; outer lip slightly reflected, with eight nodulous spirals on its outer surface. Height 7.9 mm.; diam. 2.2 mm. Fairly Common. Beach, Gulf St. Vincent to Venus Bay.

N. FESTIVA A. Adams 1851 (*Triphora*). Pl. 1; fig. 16. Short, broad, bulging centrally; white, with brown interrupted bands, base light-brown; two equal rows of large gemmules in each whorl, interstices deeply punctuated; whorls flat; base rounded, smooth. Height 6.4 mm.; diam. 2.1 mm. Common. Beach, Gulf St. Vincent to St. Francis Island. In the larger forms a threadlet arises in the later whorls between the two spiral rows and becomes a third smaller row.

N. PFEIFFERI C. & F. 1865 (*Triphora*). Pl. 1; fig. 14. Elongate, narrow, tapering; usually glistening, pearly white, with base violet-brown, and the ledge just above the suture articulated brown and white, but it may be unicoloured, of a dark violet-brown or any intermediate tint; two spiral gemmule rows, the lower very prominent. Height 5.5 mm.; diam. 1.3 mm. Our most common species. Beach MacDonnell Bay to St. Francis Island.

N. SCITULA A. Adams 1851 (*Triphora*). Elongate, tapering; glistening white, base brown; three spiral gemmule rows in the larger whorls, the median, large, prominent, collar-like. Height 6 mm.; diam. 1.7 mm. Uncommon. Port Lincoln. Shells in the South Australian Museum conform to Adams' description, but Hedley held that *scitula* was identical with *pfeifferi* C. & F. having the supra-sutural ledge modulated so as to look like a pearl row.

N. SPINA Verco 1909 (*Triphora*). Very long and narrow; light amber tint; spirals four, slightly tuberculate with low, long nodules united by low, broad, axial ribs; adult whorls 17; outer lip crenulated by the spirals and extended spur-like towards the base; canal nearly closed at this point, curved to the left and reflected. Height 12.4 mm.; diam. 1.9 mm. Uncommon. Dredged, Beachport and Cape Jaffa, 90 to 200 fathoms.

CAUTOR Finlay 1926. Protoconch of three whorls, apex short, blunt, asymmetrical, second and third whorls with two heavy spiral keels, abruptly breaking into two rows of sharply defined nodules in the succeeding spire whorl. Type—*Triphora obliqua* May 1915.

C. OBLIQUA May 1915 (*Triphora*). Pl. 1; figs. 9 & 10. Very elongate, tapering; yellowish-brown; three nodular keels on larger whorls, nodules tending to form axial ribs; whorls 20, flattened, broadest at the lower suture; mouth rather square, produced behind into a tubular canal. Height 7.5 mm.; diam. 1.9 mm. Uncommon. Dredged, Cape Jaffa to Beachport, 55 to 300 fathoms.

C. MACULOSA Hedley 1902 (*Triphora*). Pl. 1; fig. 13. Solid, broad, conical, bulging centrally; variegated with opaque white, buff and chocolate, usually articulated with chocolate and white beneath the suture, base chocolate, apex white; three equal rows of gemmules on the penultimate whorl and those immediately above, and four rows on the body-whorl; gemmules large, round; whorls, 10, convex; base with two plain spiral keels; posterior notch extended into a spur; basal canal short, straight. Height 6 mm.; diam. 2 mm. Common. Beach Gulf St. Vincent.

C. LABIATA A. Adams 1851 (*Triphora*). Short, broad, conical, bulging centrally; glossy; larger whorls dark chocolate persisting above as a sutural thread, the rest paling to buff; three spirals with small, close-set, ill-defined gemmules on the larger whorls; whorls 10, convex; suture deep; posterior notch deep, subcircular, basal canal short, recurved. Height 4.2 mm; diam. 1.5 mm. Not common. Beach Kingston to Venus Bay.

C. AMPULLA Hedley 1902 (*Triphora*). Narrowly conical, bulging centrally; chequered by alternate squares of white and chocolate, apex white or brown, base chocolate; three equal spirals of large gemmules on larger whorls. Height 5 mm.; diam. 1.6 mm. Uncommon. Dredged, Beachport to St. Francis Island down to 110 fathoms. This species is smaller than *C. maculosa*, larger and narrower than *N. festiva*, although colour and shape are similar.

C. REGINA Hedley 1902 (*Triphora*). Narrowly conical, bulging centrally; white, a narrow orange line along the lowest gemmule row; an orange tip to the canal; three equal rows of gemmules on the last whorl, three simple spirals on base; whorls 12; posterior notch rather deep, narrow; basal canal nearly closed reflected, notched. Height 5 mm.; diam. 1.5 mm. Uncommon. Dredged, Beachport to St. Francis Island, 35 to 150 fathoms.

C. NOVAPOSTREMA Verco 1910 (*Triphora*). Broad, conical; white; three equal gemmule rows on the larger whorls, crossed by axial lirae, about 14 in the last whorl; the third gemmule row arises in the first adult whorl, above the others; usually in this group when a third spiral arises it is between the other two. Height 3.1 mm.; diam. 1.2 mm. Uncommon. Cape Borda 55 fms. also Gulf St. Vincent.

TERETRIPHORA. Finlay 1926. Protoconch smooth, several whorled, with a flattened dome-shaped top and a strong medial groove formed by spiral keels on its later whorls. Nodular sculpture of shell obsolete, having the appearance of a reversed *Seila*. Type—*Triphora huttoni* Suter 1908. (New Zealand).

T. GEMMEGENS Verco 1909 (*Triphora*). Pl. 1; figs 7 & 8. Solid, conical, bulging centrally; whorls with three spiral keels, not gemmed, the upper two closer than the lower; whorls 8, somewhat convex, suture well marked. Height 8 mm.; diam. 2 mm. Not common. Beachport, 40 fathoms.

T. ANGASI C. & F. 1865 (*Triphora*). Solid, glossy, tapering, bulging centrally; buff, with a chocolate base and sutural band; gemmules white; four spirals on the last whorl, three on the whorls immediately above, the middle row nearer to the upper than the lower row, base with one spiral thread; whorls 13, slightly convex; suture distinct; mouth somewhat square. Height 7 mm.; diam. 2 mm. Common. Beach, Gulf St. Vincent to Scales Bay.

T. LEUCA Verco 1909 (*Triphora*). Solid, tapering; white or light-brown, others just tinted brown over a vertical extent to the spire; three gemmule rows on the larger whorls. Height 8; diam. 2 mm. Common. Beach Corney Point to Scales Bay.

T. CINEREA Hedley 1902 (*Triphora*). Narrow, conical with straight sides, base dark chocolate, spire marbled with ash and brown, or brown with ash gemmules, the ashy tint predominating; three spiral rows of faint gemmules crossed by about 21 axial riblets, base with one plain spiral cord. Height 8 mm.; diam. 2 mm. Not common. Beach Gulf St. Vincent, St. Francis Island down to 50 fathoms.

T. SPICA Verco 1909 (*Triphora*). Long, narrow, upper third elongate, conical, rest nearly cylindrical; light brown with darker axial streaks from suture to suture; three faintly nodulous spirals from the sixth whorl downwards; whorls 17. Height 9.7 mm. diam. 1.5 mm. Uncommon. Gulf St. Vincent, Cape Borda, 25-50 fathoms.

T. KESTEVENI Hedley (*Triphora*). Elongate, tapering gradually to the apex; pale pink; last whorl four, the others three smooth spiral ribs, the uppermost largest; whorls 12; interstices punctate. Height 5 mm.; diam. 1.25 mm. Neptune Island, 104 fathoms (one specimen only).

HYPOTRIPHORA gen. nov. Protoconch of $3\frac{1}{2}$ whorls; first whorl with two high, narrow, smooth keels joining at the apex to form a tongue; a third smaller, infra-sutural keel develops on the second whorl. Type—*Triphora subula* Verco 1909.

H. SUBULA Verco 1909 (*Triphora*). Pl. 1; figs. 11 & 12. Very elongate, tapering, light-horn tint; the posterior spiral darker, three spiral ribs, somewhat nodular, especially the central rib; the last six whorls have a supra-sutural smooth, thin ledge; whorls 20. Height 13 mm.; diam. 1.8 mm. Uncommon. Gulf St. Vincent. Dredged, Cape Borda 55 fathoms.

TURRITELLIDAE.

"Screw Shells." Elongate, tapering, many-whorled, spirally striated or keeled, lines of growth wavy; mouth rounded or subquadrate; outer lip thin, usually with sinus, Operculum horny, multispiral. Cosmopolitan, shallow water and deep water. Fossil Trias.

GAZAMEDA Iredale, 1924. Spire long mouth sinuate, simple operculum. Animal viviparous. Type—*T. gunnii* Reeve 1849

G. TASMANICA Reeve 1849 (*Turritella subsquamosa* Dunker 1871; *oxyacris* Tate 1897). Pl. 2; fig. 1. Attenuated, yellowish white, with faint, small, ruddy blotches; finely sculptured with two or three inconspicuous keels; whorls flattened; base angulated, flattish; mouth oval, oblique; outer lip thin, translucent, with curved, open sinus. Height 48 mm.; diam. 10 mm. Beachport to Cape Borda down to 55 fathoms.

COLPOSPIRA Donald 1900. Shorter than *Gazameda* and more sinuate, subquadrate mouth; outer lip arched obliquely backwards above a deep sinus; slightly canaliculated at base; protoconch of two smooth rounded whorls. Animal oviparous. Type—*T. runcinata* Watson 1881.

C. RUNCINATA Watson 1881 (*Turritella*). Pl. 2; fig. 2. Broadly conical; yellowish, tinged and speckled with brown and white; two moderate spiral keels, and fine, irregular, interrupted spiral threads; whorls 15, almost flat; mouth squarish; outer lip with deep sinus. Height 42 mm.; diam. 12 mm. Common, dredged. There is also a lilac-tinted variant.

C. CIRCUMLIGATA Verco 1910 (*Turritella*). Solid; pale yellow-brown tint with a broad brownish spiral over the middle of the base; four spiral cords developing from the fourth whorl, the round supra sutural cord, the strongest, projects beyond the suture; whorls 13; base flatly rounded, with five flat low spiral cords; mouth slightly effuse; outer lip simple, corrugated by the spirals; inner lip a broad glaze. Height 17 mm.; diam. 6 mm. Uncommon. Type, Beachport 110 fathoms.

C. ACCISA Watson 1881. (*Turritella higginsii* Petterd, 1884). Solid, tapering; brownish-yellow with ruddy irregular spots; two blunt spirals on the last whorl, lower one stronger; surface scored between spirals by several threads; whorls 15, almost flat; base flattish; suture sharp; outer lip expanded, with a deep, rounded, sharp sinus, thinnish, speckled. Height 40 mm.; diam. 9 mm. Beachport to Cape Borda, 40-200 fathoms.

C. MEDIOLEFIS Verco 1910. (*Turritella*). Small, turreted, narrow; white, light-brown at the base and below the suture; upper spire whorls with an indistinct band both below and above

the suture, in the fifth whorl each band divides in two leaving the central part smooth, whence the specific name; penultimate whorl with eight unequal, low flat spirals increasing to fifteen in the body whorl and base; spirals crossed by sinuous axial striae; spire adult whorls 9, at first flat and sloping, then becoming convex and subsequently round; mouth widely effuse in front; outer lip thin, rather expanded over a minute perforation. Height 5.2 mm.; diam. 1.5 mm. Uncommon. Beachport to Neptune Islands, 40-104 fathoms.

PLATYCOLPUS Donald 1900. Distinguished from *Colpospira* by the much broader and shallower sinus; columella more nearly straight, without a backward twist; protoconch of two smooth convex whorls; operculum as *Colpospira*. Type—*T. quadratus* Donald.

P. QUADRATUS Donald 1900. (*Turritella*). Pl. 2; fig. 3. Pyramidal; light yellow, flamed with brown and spotted with dark-brown; sculpture of numerous strong spiral threads; aperture subquadrangular with a broad shallow sinus in the outer lip; inner lip spread on the body whorl; base slightly convex. Height 19 mm.; diam. 6.5 mm. Uncommon. South of Cape Wiles, 100 fathoms.

STIRACOLPUS Finlay 1926. Protoconch paucispiral of one or two whorls without a keel; sculpture of few subequal spirals and few interstitial riblets. Type—*T. symmetrica* Hutton. (New Zealand).

S. SMITHIANA Donald 1900. (*Turritella*). Small, turreted; sculpture of four strong keels, five on the body whorl and fine threads on the base between the keels; whorls 12, convex or slightly angular; base convex; mouth subquadrate, channelled below; outer lip rather deep and widely sinuate; umbilicus closed. Height 9.5 mm.; diam. 3 mm. Cape Jaffa, Beachport, 130-200 fathoms.

S. ATKINSONI Tate & May 1900. (*Turritella*).—*T. tasmanica* Ten-Woods 1876, *T. godeffrayana* Donald 1900. Elongate turreted, white; four principal spiral keels, the interstices girdled with fine equidistant spiral striae; whorls 11, angulate; base rounded, spirally lirate; mouth quadrate, sinuous; columella white, enamelled, and well defined. Height 13 mm.; diam. 4 mm. Beachport, Cape Jaffa, 90-200 fathoms.

S. MEDIOANGULATA Verco 1910. (*Turritella*). Rather thin, turreted; yellowish-brown, lighter along the suture, the earlier whorls translucent white, tinged brownish along the angu-

lation; body whorl with round cord-like carina forming the periphery at the suture; sculpture on the spire whorls consists of spiral striae, mostly obsolete, seven in the penultimate; whorls 12, angulate; base nearly flat with numerous spiral striae; mouth hexagonal, effuse; outer lip thin, with a wide deep sinus. Height 12.9 mm.; diam. 3.6 mm. Beachport to Neptune Islands, 90-200 fathoms.

S. IREDALEI Finlay 1927. (*Turritella Clathrata* Kiener 1843). Pl. 2; fig. 4. Rather thin, turreted, light or dark purplish brown with lighter brown encircling the ribs (beach rolled specimens are almost white); two prominent equal spiral keels and 7-10 spiral striae crossed by very fine lamellar striae; whorls 17, flattish or slightly concave; base angulate with crowded growth laminae crossing a dozen spiral striae; mouth sub-quadrate; outer lip with sinus between the keels. Height 48 mm. (nearly 2 ins.). diam. 9 mm. Very common. All along the coast as far as Point Sinclair.

S. NEPTUNENSIS Verco 1910 (*Turritella*). Turreted; white; inconspicuously medially keeled, otherwise smooth; protoconch papillate, projecting, of 3 convex whorls; 9 spire whorls of which 6 are medially angulate the rest becoming quite convex with about 7 faint spiral lirae. Height 6 mm.; diam. 1.4 mm. Neptune Islands, 104 fathoms.

S. KIMBERI Verco 1908. (*Turritella*). Thin, narrow; translucent white; low spiral ribs (6 in penultimate whorl) with opaque white spiral lines between them; protoconch of 4 smooth, convex whorls; spire whorls 10, well-rounded; base convex; mouth slightly oblique, elliptical, effuse, outer lip thin, convex. Height 7.7 mm.; diam. 1.7 mm. Uncommon. Beach Pt. Willunga, dredged Backstairs Passage. *Seilaerx turritelliformis* Hedley, superficially resembles this but differs in its anterior notch.

GLYPTOZARIA Iredale 1924. Outer lip without a sinus; all the other known Australian members of the *Turritellidae* have a sinus more or less deeply marked. Type—*T. opulenta* Hedley.

G. OPULENTA Hedley 1907. (*Turritella*). Pl. 2; fig. 5. Rather solid, glossy, milk-white, irregularly marbled with pale brown; upper whorls with 2 projecting spiral keels, three spiral threads intercalated later; fine close radial riblets lattice the adult whorls with the spirals; protoconch of 2 smooth globose whorls; spire whorls 8, convex; base slightly concave with 4 faintly raised spirals; mouth ovate angled above, effuse below; outer lip sharp; columella straight, slightly thickened. Height 6 mm.; diam. 2 mm. Cape Borda, 55 fathoms.

CAECIDAE.

Shell minute, tubular, curved, with a spiral plane nucleus. Operculum horny, multispiral. Cosmopolitan. Fossil, Tertiary.

CAECUM Fleming 1824. "Blind-shell." When young discoidal, when adult decollated, tubular, cylindrical, curved; aperture round, entire; apex closed by a mammillated septum where the original spire has been lost.

C. AMPUTATUM Hedley 1893. Pl. 2; fig. 6. Subcylindrical, slightly bent, smooth, glossy, white; aperture slightly expanded; very fine lines of growth. Height 2 mm.; diam. 0.5 mm. Uncommon. Shell sand Guichen Bay.

STREBLOGERAS Carpenter 1858. Not decollated, the protoconch lying in a plane perpendicular to the adult tube.

S. CYGNICOLLIS Hedley 1894. Pl. 2; fig. 7. Minute, glossy, translucent; delicate growth rings, which later become broader and stronger; protoconch of two whorls in one plane, remainder describing half a revolution of a long drawn spiral in a plane oblique to the first; a ring-varix at one fifth of the length. Height 3.35 mm.; diam. 0.45 mm. Cape Borda, 55 fathoms.

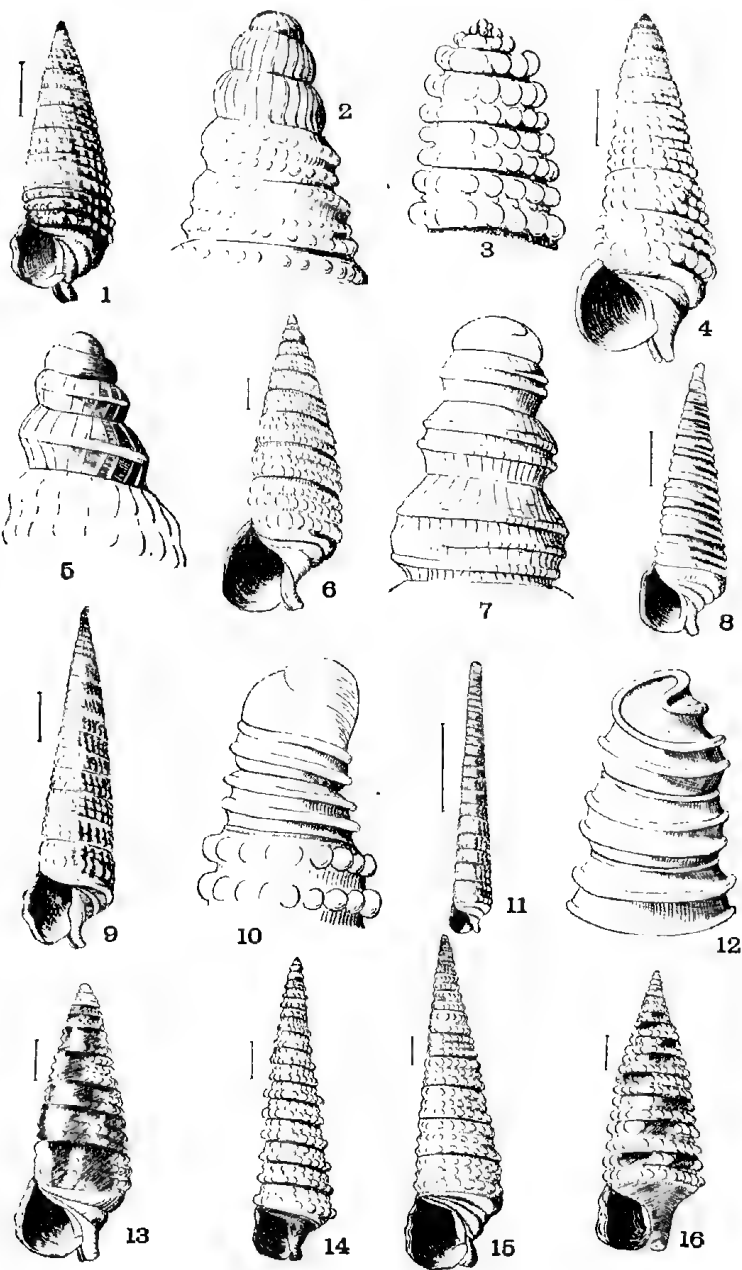
LIPPISTIDAE.

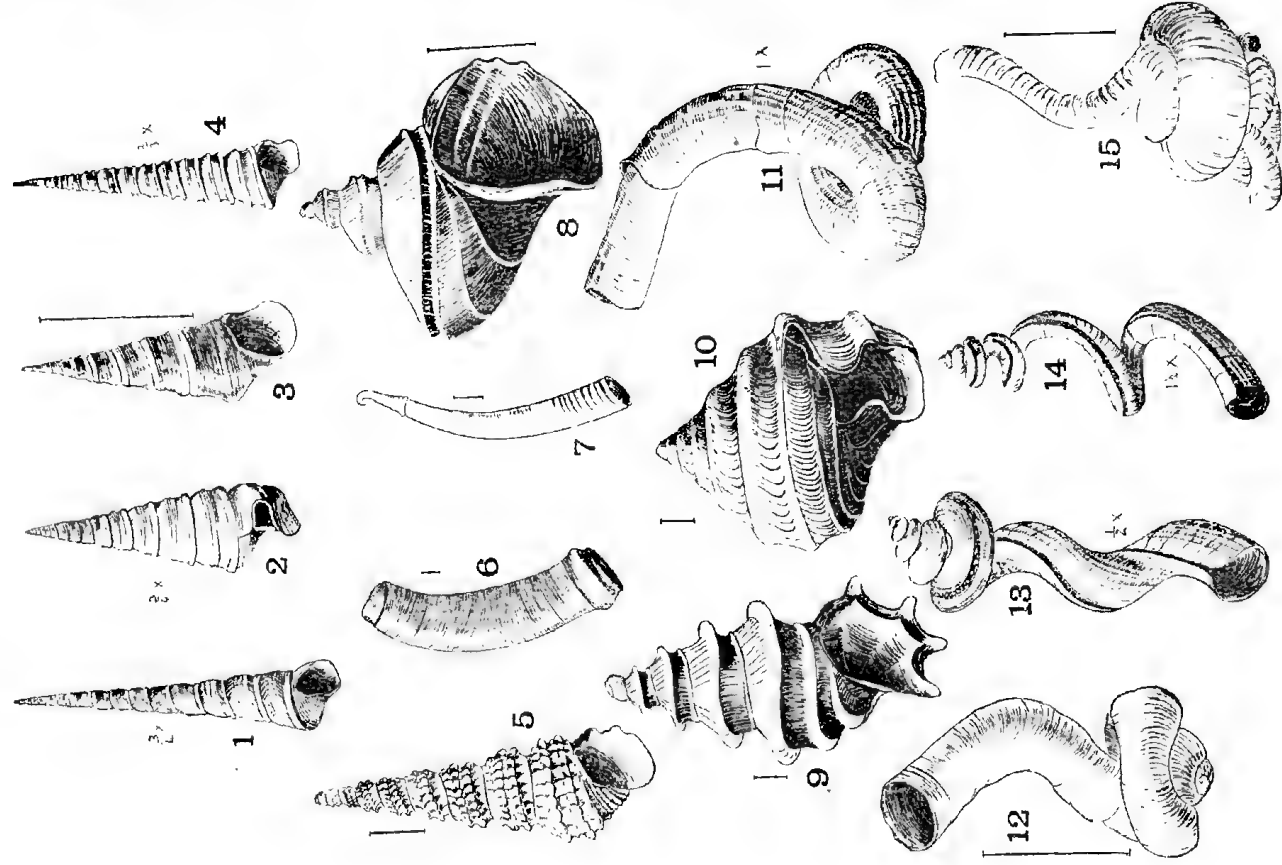
Shell thin, turbate, keeled, periostracum fringed on the keels, umbilicated; mouth angulated or subchannelled below, lip sharp, columella obliquely truncated; operculum lamellar; nucleus external. West Indies, Japan, Philippines, Australasia, South Africa.

LIPPISTES Montfort 1810. Turbate, dilated below; spiral cords crossed by finer axial lirae; spire short, angular, shouldered; whorls not numerous, first convex, then angular, last whorl large; base with a keel around the umbilicus; mouth ear-shaped, angled above, beak-like below; columella smooth, concave, narrowed below. Type—*Turbo separatista* Dillwyn. (Africa). Widely distributed at moderate depths.

L. MERIDIONALIS Verco 1906. Turbate, solid; three broad spiral bands on spire, four on body-whorl; a less marked peripheral keel forms the suture; crowded axial threads cross the keels; protoconch of $1\frac{1}{2}$ whorls, convex, smooth but for 4 equal lirae; whorls 5, rapidly increasing; base somewhat concave, lirate; outer lip corrugated; columella with tooth-like prominence below; umbilicus, a chink. Height 3.6 mm.; diam. 2.9 mm. Beachport, 40 fathoms.

L. GABRIELI Prit. & Gat., 1899. Pl. 2; fig. 8. Tubinately conical, thin; light brown, covered with a thin horn-coloured periostracum; sculpture of 3 spiral keels, the upper two close and situated at the angle of the whorl; protoconch of $1\frac{1}{2}$ smooth whorls; body whorl very much larger than the preceeding one; $5\frac{1}{2}$ whorls





EXPLANATION OF PLATES.

PLATE I.

- Fig. 1. *Eutriphora cana* Verco.
- Fig. 2. *Eutriphora cana* Verco, protoconch.
- Fig. 3. *Isotriphora tasmanica* Ten Woods, protoconch.
- Fig. 4. *Isotriphora tasmanica* Ten. Woods, protoconch.
- Fig. 5. *Notosinister granifera* Brazier, protoconch.
- Fig. 6. *Notosinister granifera* Brazier.
- Fig. 7. *Teretriphora gemmegens* Verco, protoconch.
- Fig. 8. *Teretriphora gemmegens* Verco.
- Fig. 9. *Cautor obliqua* May.
- Fig. 10. *Cautor obliqua* May, protoconch.
- Fig. 11. *Hypotriphora subula* Verco.
- Fig. 12. *Hypotriphora subula* Verco, protoconch.
- Fig. 13. *Cautor maculosa* Hedley.
- Fig. 14. *Notosinister pfeifferi* Crosse & Fischer.
- Fig. 15. *Notosinister innotabilis* Hedley.
- Fig. 16. *Notosinister festiva* Adams.

PLATE II.

- Fig. 1. *Gazameda tasmanica* Reeve.
- Fig. 2. *Colpospira runcinata* Watson.
- Fig. 3. *Platycolpus quadrata* Donald.
- Fig. 4. *Stiracolpus iredalei* Finlay.
- Fig. 5. *Glyptozaria opulenta* Hedley.
- Fig. 6. *Caecum amputatum* Hedley.
- Fig. 7. *Streblóceras cygnicollis* Hedley.
- Fig. 8. *Lippistes gabrieli* Pritchard & Gatliff.
- Fig. 9. *Icuncula torcularies* Ten. Woods.
- Fig. 10. *Seguenzia polita* Verco.
- Fig. 11. *Vermicularia siphon* Lamarck.
- Fig. 12. *Lilax nucleogranosum* Verco.
- Fig. 13. *Siliquaria australis* Quoy & Gaimard.
- Fig. 14. *Siliquaria weldii* Ten. Woods.
- Fig. 15. *Magilina caperata* Tate & May.

in all; widely and deeply umbilicate; inner lip almost straight; slightly concave in the middle, outer lip semicircular, simple. Height 12 mm.; diam. 12 mm. Backstairs Passage, 16-18 fms.

ICUNCULA Iredale 1924. Screw shaped, shining, solid, prominently spirally keeled. Type.—*Lippistes torcularis* Ten-Woods.

I. TORCULARIS Ten-Woods 1877. (*Lippistes*). Pl. 2; fig. 9. Small, solid, pyramidal; sordid white, shining; prominent spiral keel on centre of each whorl which makes the shell appear like a small screw; base tricarinate; protoconch subvertical, smooth; adult whorls 4, elevated, acute; mouth rounded, entire, outside quadricostate. Height 3.5 mm.; diam. 1.5 mm. Beachport, Cape Borda down to 40 fathoms.

SEGUENZIA Jeffreys 1876. Conical, glossy, without periostracum; groove deep, large, on upper part of last whorls; columella abruptly notched below with tooth-like prominence. Distinguished by the broad sutural slit. Type—*S. formosa* Jeffreys. (Azores).

S. POLITA Verco 1906. Pl. 2; fig. 10. Small, solid, turbinate; white, glistening; central keel forms suture on body-whorl, two others below, smaller, then 6 concentric lirae to the umbilicus; protoconch, $1\frac{1}{4}$ whorls, smooth, round; adult whorls 6, stepped, flatly concave; mouth squarish, outer lip with sinus at the suture and a deep wide notch at base. Height 3.5 mm.; diam. 2.4mm. Cape Jaffa, 300 fathoms.

VERMETIDAE.

Tubular, attached or free, sometimes septate within; sometimes regularly spiral when young, always irregular in the adult; mouth rounded, usually entire, sometimes fissured; operculum horny, annular, sometimes spiral, rarely absent; attached to stones, shells or coral, or living in sponges, often gregarious in large colonies.

Distinguished from *Serpulidae* by the spiral nuclear shell and interior septa of the tube. *Serpulidae* tube is composed of two calcareous layers, that of *Vermetidae* of three. *Serpulae* are Annelids. Cosmopolitan. Fossil, Secondary, Tertiary.

VERMICULARIA Lam 1799 (*Thylacodes*). Adherent, irregularly twisted, with three to five longitudinal nodulous lirae which do not show internally; frequently partitioned perpendicularly to the axis, operculum minute or absent.

V. SIPHO Lam 1818 (*V. arenarius* Q. & G.). Pl. 2; fig. 11. Large, vermiform, sometimes in colonies; brownish, rugged growth lines crossed by unequal longitudinal necklace—like riblets which are predominant; whorls irregularly twisted; aperture subcircular; no operculum. Up to 4 inches overall, diam. of aperture about 7 mm. Common. Cast up on Beach.

V. FLAVA Verco 1907. Circular tube coiled in flat discs of 6 mm. diameter, each disc formed of 3 or 4 spirals; the discs are superimposed to form a cylinder; followed by a free tube of moderate length up to 15 mm. long; discs may be formed from the centre outwards, or from circumference inwards; sinuous growth lines; ochre-yellow, diameter of tube 1.5 mm., moderately thick. Cape Jaffa, 130 fathoms. Beachport, 40 fathoms.

V. HEDLEYI Finlay 1927. (*V. nodosa* Hedley 1907). Small, solid, coiled, adherent to a foreign body, except a third of the last whorl which is free and semi-erect; gray; radial ribs, thick, prominent, about 20 on the last whorl, which broaden to the periphery, narrow to the suture, interstices deeply excavated; whorls three, rapidly increasing; mouth circular, its lip constituted by the final rib. Major diam. 2.25 mm.; minor diam. 1.65 mm. Shell sand.

V. WAITEI Hedley 1903. Small, solitary, white; whorls 4, first three coiled in one plane, adherent, last free, spiral, suberect, square in section with a sharp elevated rib along each angle; aperture circular, trumpet mouthed; about 3.25 mm. long. Beachport to Cape Borda, 40 to 150 fathoms.

LILAX Finlay 1926. Protoconch nautiloid, translucent, covered with minute granules. Type—*Stephopoma nucleogranosum* Verco.

L. NUCLEOGRANOSUM Verco 1904 (*Stephopoma*). Pl. 2; fig. 12. Attached, solitary or conglomerate; translucent-white or tinged pinkish-chestnut; keel prominent, rounded; growth lines rugose, round, protoconch, nautiloid, $1\frac{1}{2}$ whorls, horn-coloured or white, translucent, effuse at its aperture, covered with minute granules. The shell springs from within the trumpet-shaped mouth which projects all round; adult whorls, $2\frac{1}{2}$ in same plane, attached, then 2 whorls coiled above and adhering to those below, followed by a free, twisted tube, up to an inch in length; aperture circular; operculum horny, multispiral. Coiled portion diam., about 6 mm. Backstairs Passage, 16 fathoms.

SILIQVARIA Bruguiere 1789. Tubular, at first spiral, then irregular, protracted; tube with a longitudinal fissure, simple or formed by a series of perforations, often both varieties exist in the same specimens; mouth circular, without internal septa; operculum horny, subcylindrical or conoidal, formed by a spirally rolled band, with ciliated margin. On rocks and corals, sometimes in sponges.

S. AUSTRALIS Q. & G. 1834. Pl. 2. Fig. 13. Moderately thick, vermiform; reddish-brown (beach specimens usually whitish); whorls about 5, irregularly coiled, angulated behind, growth lines marked; slit at first closed, then with open round holes, finally a denticulated open slit; interior nacreous, greenish. A large specimen, 4 inches over all. Diam. of aperture, 11 mm. Common, all beaches.

S. ANGUINA Linne 1758 (*Tenagodus*). Distinguished from *S. australis* by its scaly longitudinal ribs. Lives in blackish-purple sponge, which stains the shell violet. Diam. 3 mm. St. Francis Island, 35 fms.

S. WELDI Ten-Woods 1875 (*Tenagodus*). Pl. 2; Fig. 14. Thin, loosely coiled; white, yellowish or very light rose, shining, smooth; growth lines distinct, sigmoid on outer edge of tube; slit filled below in first 3 whorls, afterwards open, simple; whorls about 6, closely coiled together at apex, then rapidly unfolding. Up to 30 mm.; diam. of aperture, 4 mm. Common, all beaches.

MAGILINA Velain 1877. Nucleus free, spiral, of one whorl only; adult shell prolonged into a tube; irregularly coiled, attached to surface of submarine bodies.

M. CAPERATA Tate & May 1900 (*Thylacodes*). Pl. 2; Fig. 15. Agglomerate, reddish-brown; ridges, transverse, rounded, close set; coils cone-shaped, reciprocally adherent; free tubular portion narrowed, irregularly bent, aperture circular. Length of tube, 10 mm.; diam. base, 4 mm.; height cone, 2 mm.

M. DEPOSITA Hedley 1909. Small, irregularly coiled; ribs, radiate, coarse, irregular; protoconch of two whorls, followed by 3 or 4 loose prostrate coils, finally rising free and erect for a short length. Length of coil 4 mm.; breadth 2.5 mm.; diam of tube, 0.7 mm.

Nomenclatural Note.

by BERNARD C. COTTON.

In the Rec.S.Austr. Mus., iv. No. 3, 1931, p. 341, a new genus was introduced under the name *Neogaimardia*, which was preoccupied by Finlay. This genus is here re-named *Eugaimardia*.

SHELL COLLECTORS' CLUB.

During the past quarter, families *Triphoridae*, *Turritelidae*, *Permetidae*, *Scalidae*, and *Cymatiidae* have been reviewed, particulars of some of these families are dealt with under a separate authorship in this issue. In future, the Club will meet on the FIRST MONDAY of the month only, instead of fortnightly as previous. Less time will be devoted to those shells which are rare and not likely to be found on our local beaches. At the September meeting, *Cypracidae* (Cowries), and October, *Volutidae* (Volutes) are on the programme.

BOTANICAL NOTES ON CENTRAL AUSTRALIA.**Fraser Creek and Mt. Ultim, 150 miles N.E. of Alice Springs***By J. B. CLELAND, M.D.*

In August, 1930, under the auspices of the Board of Anthropological Research of the University of Adelaide, and financed in great part by funds provided by the Rockefeller Foundation and administered by the Australian National Research Council, a small expedition, the fourth of its kind, left Adelaide for Alice Springs and journeyed thence about 150 miles N.E. to MacDonald Downs on the Fraser Creek to study various aspects of native life. The admirable team-work, organised by Dr. T. D. Campbell, resulted in the collection of a large amount of materials of very considerable anthropological value. These included measurements of a number of adults; notes on the colour of the eyes, the degree of pigmentation, the dentition, the physiological and psychological responses, and the methods of collecting and preparing foods and making implements; photographic, cinematographic and gramophone records; blood groups; the compiling of a vocabulary; genealogical records and their features. The results of this nature will be recorded in various suitable publications.

During the journey there and back and as opportunity permitted at MacDonald Downs itself, botanical notes were made and plants collected. The present communication is to give a short and general account of these observations.

On the journey up it was soon seen, after leaving Marree, that the recent rains had brought up a great variety of vegetation, chiefly annual, especially where the water had collected in depressions and runlets. It was tantalising to see, as we passed in the train, here and there beautiful patches of colour from plants in flower. The most was made of short stops at wayside stations and the time between these was in great part spent in placing the specimens collected in presses. The plants were mostly specifically distinct from those in the southern parts of the State. Certain Natural Families predominated both in numbers of species and of individuals, and these again contrasted with those to which most of us are accustomed. Cresses were abundant and the fruits in some, such as species of *Lepidium* and *Stenopetalum*, so picturesque as to seem worthy of cultivation—they certainly looked well in vases. There were, of course, a number

of the Saltbush family, some annuals, others perennial and slowly recovering from the prolonged drought. Composites were numerous and often showy. There were several peas (*Swainsona*). A beautiful little fleshy plant with a yellow flower found at one stopping place turned out to be *Gunniopsis zygophylloides*. Grasses were few.

By day-break next day we found ourselves in Central Australia near the Finke River. This part had had little rain and it was only when some 30 or 40 miles south of Alice Springs that wayside flowers again made their appearance. Here we were charmed to see a familiar plant of our hills, *Brunonia australis*, whose rich blue heads of flowers look, at first sight, like those of a composite. But the Central Australian form is still prettier than ours, as each plant as seen from the railway window seemed to have several heads of flowers instead of one as is usually the case with us.

Soon after reaching Alice Springs, about mid-day, we were off again under Mr. Colson's charge in the motor cars and a motor lorry with our gear. We passed through the MacDonnells, going 'up the road' as the phrase is for traveling along the Darwin track, and onto the Burt Plain, mulga covered, but rather dry. After about 30 miles we camped at Anthony's Well, and from here branched off the main road next day east and a little north towards MacDonald Downs. All that day we travelled through interesting country, passing through mulga or across more open plains, over sundry dry water-courses lined by red gums, and sometimes close to bold, rocky hills. Mountain masses loomed up at times in the distance. At last at dusk we reached our destination and found a kind welcome and an excellent camping place prepared.

Macdonald Downs is an area about 30 miles from east to west and about 20 miles from north to south, leased by Mr. Chalmers and stocked with some sheep and cattle. It is on the outskirts of civilisation, there being only one other occupied property between it and the Queensland border. Mr. Chalmers has been on it for several years. The homestead itself is situated on the Fraser Creek some 10 miles or so before its junction with the Bunday.

From a botanical point of view the district may be divided up into the plains, the water courses, and the rocky, stony, and sometimes high hills. The water courses traverse the plains and many of them have dug 8 or 10 feet below the surface level. Great torrents come down them at long intervals after heavy rains. Vegetation on the plains varies from grassy portions to others covered with open shrubs. Near Macdonald Downs homestead

was a rough, stony hill, very difficult to walk over on account of loose and projecting stones. The elevation of this hill was low but some dozen miles away real mountain peaks, covered with rugged rocks towered up. It may be of interest to give a brief description of these three different botanical divisions.

1. **The Rivers and their Banks.** The Fraser Creek at Macdonald Downs is about 30 yards across, with a coarse, sandy bed in which are many fragments of common opal, and with banks up to 10 feet high of red sandy loam. The creek traverses extensive plains and passes between low rises of sandstone or of a granitic rock, or close to occasional slight sandy rises. Growing usually from the base of the banks are enormous river Red Gums (*Eucalyptus rostrata*), some of whose branches spread out horizontally over the bank just above the ground. Sometimes on the river-side of the bank but usually on the level ground above, and extending occasionally some few hundred yards on to the adjacent plain, are the beautiful pure white boles of *E. papuana*. These trees with somewhat drooping branches, with leaves whose lateral veins are nearly parallel, and with rather small, truncate, urn-shaped capsules, are remarkably handsome. The boles have no adherent bark at the base and have a white bloom which readily brushes off. The trunks of *E. rostrata* are sometimes almost as pure a white and may even have some white bloom on them, so that it may be difficult to decide at a glance, until the leaves or capsules are examined, which of the two species one is looking at. Other examples of the Red Gum are slightly greyish in patches, or even somewhat bronzed. Some trees of *E. papuana* were obviously sick, being partly leafless and having the trunk disfigured with dark adherent patches of bark. On the tops of the banks and the plains adjacent, grows the blood wood, *E. pyrophora*, the tessellated trunk often irregular and bent, heavy in fruit with the large urn-shaped capsules constricted towards the summit, their weight often bending down the terminal branches. Iron-wood (*Acacia estrophiolata*) is common also on the bank, the young trees having shorter, stiffer phyllodes, and the mature trees having drooping branchlets and longer and softer phyllodes and narrow pods constricted between the seeds. Less common is the beef-wood (*Grevillea striata*) with long stiff multi-stiate leaves up to about 10 inches long. There are a few small trees or shrubs of "Supple Jack" rather like the adult Iron-wood in appearance, but with a branched inflorescence of small flowers. *Atalaya hemiglauca* with its pinnate leaves is not common.

Shrubs along the river bank comprise a *Cassia* with broad leaflets and a sub-shrubby composite. As under-shrubs are two species of *Solanum*, *malvaceous* plants such as *Malvastrum*, and still smaller a *Phyllanthus*, *Euphorbia Drummondii*, *Gentipeda*, a yellow composite, and the Australian Blue-bell, *Wahlenbergia gracilis*. As twiners we have *Convolvulus erubescens* and *Glycine* and other peas. There were a few grasses whose flowering period was long over.

**PUBLICATION No. 2 of the FIELD NATURALISTS'
SECTION of the ROYAL SOCIETY of S.A.**

Notes on the Botany and Geology of the Victor Harbour District
By PROFESSOR J. B. CLELAND, M.D., and PROFESSOR W. HOWCHIN

This is the second publication of the Section, the first, now out of print, being a pamphlet on the National Parks and Reserves of the different States of Australia, and supporting the proposal to establish Flinders Chase on Kangaroo Island. This was written by Mr. William Selway.

The present publication begins with a geological introduction by Professor Howchin, who gives a popular account of the many features of geological interest in the district, and particularly the glacial deposits, the erratics and morainic material of the Inman Valley, the Bluff and King's Point.

Professor Howchin's introduction forms a popular guide to the visitor who has an interest in geology.

The main body of the book is an account by Professor Cleland of the ecological divisions of this very varied district. Through several years of skilful collection, Dr. Cleland has been able to list no less than 732 species of plants arranged according to the different environments from sandy beach to stony range. The whole forms a natural history guide to one of the most varied and most interesting divisions of the State. A number of illustrations add to the value of brochure which is sold at the modest price of one shilling. The publishers are Coles' Book Arcade, Rundle Street.

THE ORIGINAL FLORA OF THE ADELAIDE PLAINS PART II.

An Early Description of the Plains of Adelaide.

By J. BURTON CLELAND, M.D.

In the Proceedings of the Royal Geographical Society of Australasia, South Australian Branch, Session 1298-9, Vol. XXX, pp. 21-73, are given extracts from the Journal of George Stevenson first editor of the "Colonial Register and Gazette," who sailed for South Australia in the 'Buffalo' with Governor Hindmarsh in July, 1836. He was present at the reading of the Proclamation of the Province on Wednesday, December 28, 1837, and under that date gives a short description of the botanical features of the surroundings.. "We were all delighted with the aspect of the country and the rich soil of Holdfast Plains. Mount Lofty and the hills before us were wooded to the very summits, 1,500 feet at least above the level of the sea. On the plains there are numerous splendid trees of the eucalyptus species (the reference is probably to *E. rostrata* on the flood plains). The *Banksia rosa marina* (evidently *B. marginata*) was in great beauty. We found the pea (perhaps *Lotus australis*), buttercups (December occurs too late for the flowering of the showy *Ranunculus lap-paceus*, so perhaps one of the insignificant water-loving species was seen), the camomile, daisy (it is hard to decide what December-flowering species these two composites were), and geranium, (perhaps *Pelargonium australe* which grows on our sandhills), the flax plant (this may have been our Australian flax, *Linum marginale*, but is perhaps more likely to have been the Australian Blue-bell, *Wahlenbergia gracilis*, of the *Campanulaceae*), the kangaroo grass (*Themeda triandra*), in great abundance. The parrots and parroquets were very numerous. . . . Nothing, in fact, can be richer than the soil."

On December 31, Stevenson proposed the name of Glenelg for the site of their camp. He "walked on the proposed site of the city, about five miles from Glenelg (considerably more), over level land studded with trees, and every here and there, a stretch of rich meadow-land, which only wants to be turned over to produce a heavy crop of Indian corn or wheat. It is a loam, more or less, mixed with sand, the grass in many places three or four feet high, and the whole tract evidently of the most luxurious description. . . . The river is very deep and runs a strong current at the city, but loses itself some miles below it in an extensive flat. It runs from the hills below Mount Lofty, the whole ranges of which are covered with fine wood and grass to

the very summits. There is little or no brushwood, and the country seems in many places as if it was laid out in the first style of Capability Brown."

On Friday, January 20, Stevenson walked again to Adelaide, but was not now quite so pleased with the site. "The position is very good for a farm, but for a commercial city seven miles from a harbour—that will never do. There is, besides, nothing but the eucalyptus, or bluegum (this must refer to *Eucalyptus leucoxylon*, but surely there were splendid red gums, *E. rostrata*, on and near the banks of the Torrens—a few may still be seen in the Botanic Gardens), altogether worthless for any purpose of building or enclosure. The trees are very few and mostly damaged by fire. The choice of the capital, therefore, has been made in a spot where there is no fuel, seven miles distant from a harbour where there is no fresh water. Oh, had we but a Yankee surveyor to help us, all would be well." Returning to Glenelg next day, his companion George left him in pursuit of some wild turkeys, and owing to all the tracks being so like each other, it took them an hour's hunt before they met again.

ADDITIONS TO OUR LIBRARY.

"South Australia: A Geographical Study, Structural, Regional and Human." By Charles Fenner, D.Sc., Lecturer in Geography, University of Adelaide, Superintendent of Technical Education, South Australia, and Winner of Syme Prize for Australian Geographical Research.

In this volume, Dr. Fenner presents a detailed view of the geography and historical development of the State and its resources. The description of the Capital city and its surroundings is particularly full and new interest in our own surroundings will be aroused in every reader of these pages, which might well serve as a guidebook in our excursions. Bearing in mind that the study of Geography, like Charity, begins at home, the author makes the thorough understanding of the immediate neighbourhood the starting point for the general study of the whole State, its controlling conditions geological, geographical and climatic in an interesting style and shows how the development of the State has been controlled by these conditions. The volume is admirably illustrated by a profusion of views, maps, and graphs. Though serving as a text-book, the story is set out so simply that it makes admirable reading for any person who is interested in gaining a knowledge of the world about him. A glossary of the technical terms used adds to the value of the book for the general reader. The book is published by Whitcomb and Tombs at seven shillings and sixpence.

BOTANICAL NOMENCLATURE.

With regard to the publication of the Rules and Proceedings of the Cambridge International Congress, which was held in August, 1930, Mr. J. M. Black, A.L.S., who was one of the Australian delegates to the Congress, states:—Dr. T. F. Chipp, of the Royal Botanic Gardens, Kew, one of the Hon. Secretaries of the Congress, writes, under date of 4th May, that the report containing the proceedings of all sections will probably be finished as far as proofs are concerned, by the middle of June, when printing and publishing will be proceeded with at the Cambridge University Press. The volume will contain between 600 and 700 pages. The subject which is probably of most interest to botanists are the amended rules of botanical nomenclature and the complete list of generic names to be conserved. With regard to these, Dr. Chipp writes:—"The nomenclature rules are a subject for which Dr. Briquet, of Geneva, is solely responsible as head of the International Standing Committee. I regret that I have no news of these beyond that Fischer, of Jena, is likely to be the publisher again."

THE ANNUAL MEETING.

This was held on August 18th. A good number of members attended. The retiring officers were thanked for their services. The officers for the ensuing year were elected as follows:—

Chairman, Mr. E. H. Ising; Vice-Chairmen, Messrs. A. J. Morison and W. A. Harding; Hon Secretary, Mr. H. Woodlands; Hon Assistant Secty., Mr. L. Reynolds; Hon. Treasurer, Mr. E. V. Dix; Hon. Magazine Secty., Miss M. Roeger; Hon. Press Correspondent, Mr. D. J. McNamara; Hon. Librarian, Miss M. Roeger.

COMMITTEE.—The Officers named and Professor J. B. Cleland, Dr. Christie, and Messrs. J. K. Godfrey, F. Trigg, J. F. Bailey, H. M. Hale, and Misses J. M. Murray and E. Ireland.

FAUNA and FLORA PROTECTION COMMITTEE.—Professor J. B. Cleland, Dr. C. Fenner, Messrs. E. Ashby, W. H. Selway, J. M. Black, J. F. Bailey, A. M. Lea, F. Angel, W. Champion Hackett, B. B. Beck, J. Neil McGilp, J. Sutton, W. J. Kimber, J. F. L. Machell, H. M. Hale and Lt.-Col. D. Fulton, C.M.G., C.B.E.

AUDITORS.—Messrs. W. D. Reed, F.C.P.A., and A. J. Morison.
EDITOR "South Australian Naturalist."—Mr. Wm. Ham, F.R.E.S.

OUR EXCHANGES.

1. "The Victorian Naturalist." April, May, June, July and August numbers.
2. "The Australian Naturalist." Journal of the Naturalists' Society of N.S.W. July number.
3. "Journal of the Royal Society of Western Australia." Vol. XVI, 1929-30.
4. "Proceedings of the Academy of Natural Sciences of Philadelphia." Vol. LXXXII, for 1930.
5. "The Year Book of the Academy of Natural Sciences of Philadelphia" for 1930.
6. "The West Australian Naturalists' Club Journal" for May.
7. "Traces of Extinct Aboriginal Population on Kangaroo Island," by N. B. Tindale and B. G. Macgrath, M.B., B.S.

EXCURSIONS.

Owing to the pressure on our space to include the articles contributed, and the necessity for economy, these can not be reported in this issue, but are merely recorded. It may be said that they were all well attended, and the various leaders spared no trouble to make the various excursions informative and enjoyable. The following is the list of the excursions held since the publication of the last number of the "S.A.N."

To Hallett's Cove, June 8. Led by Mr. Ham. Geology, etc.

To Lefevre's Peninsula (Osborne), June 27. Led by Mr. E. H. Ising. Botany.

To the Museum, July 18. Led by Mr. H. M. Hale. General.

To the Beach from Henley to Glenelg, August 1. Led by Mr. F. K. Godfrey. Shells and Shore life.

To Kingston Park, August 15. Led by Mr. J. A. Hogan. Botany and the State Reserves.

LECTURES.

June 16.—"PALESTINE" by Lt.-Col. D. Fulton, C.M.G., C.B.E. Illustrated by lantern-slides.

July 21.—"A TRIP TO CAIRNS" by Mr. A. J. Morison. Illustrated by lantern-slides.

